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**TEACHER'S RESOURCE GUIDE**  
to accompany

# **The Exploring Science Program**

**ORANGE BOOK (1) and GOLD BOOK (2)**

by

**Peter Beugger**

**Billee Davidson**

**Pat Short**

**Doubleday Canada Limited**  
**Toronto**

**Doubleday Australia**  
**Sydney**

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## TEACHERS' RESOURCE GUIDE

to accompany

# The Exploring Science Program

ORANGE BOOK (1) and GOLD BOOK (2)

### PURPOSES

The two main purposes of the *Teachers' Resource Guide* to accompany *The Exploring Science Program*—*Orange Book (1)* and *Gold Book (2)*, are to:

1. provide you, the teacher, with some background information about the concepts, processes, and topics being developed in each unit.

2. suggest a wide variety of teaching strategies and learning activities for each unit, that complement, extend or reinforce the material presented in the textbook, and that give you the resources to design a program that meets the needs of individual students.

### FEATURES

#### The Unit Overview

The Unit Overview consists of the following sections:

**Concept Development.** The main concepts of the unit are discussed in terms of how they are developed in the unit; how they were introduced and presented in preceding units and how the concept relates to child development.

**Process Development.** This feature describes the processes that are developed in the activities of the unit. It also includes some in-depth discussions of process skills that particularly relate to that unit.

**Related Units.** All units in the Exploring Science Program that further develop a concept, or that develop related concepts, are listed.

**Materials and Advance Planning.** Materials needed for a student, or a group of students, to carry out the "Finding Out" activities, are listed. In some instances, suggestions are made for advance planning.

### Teaching Strategies

The Teaching Strategies include:

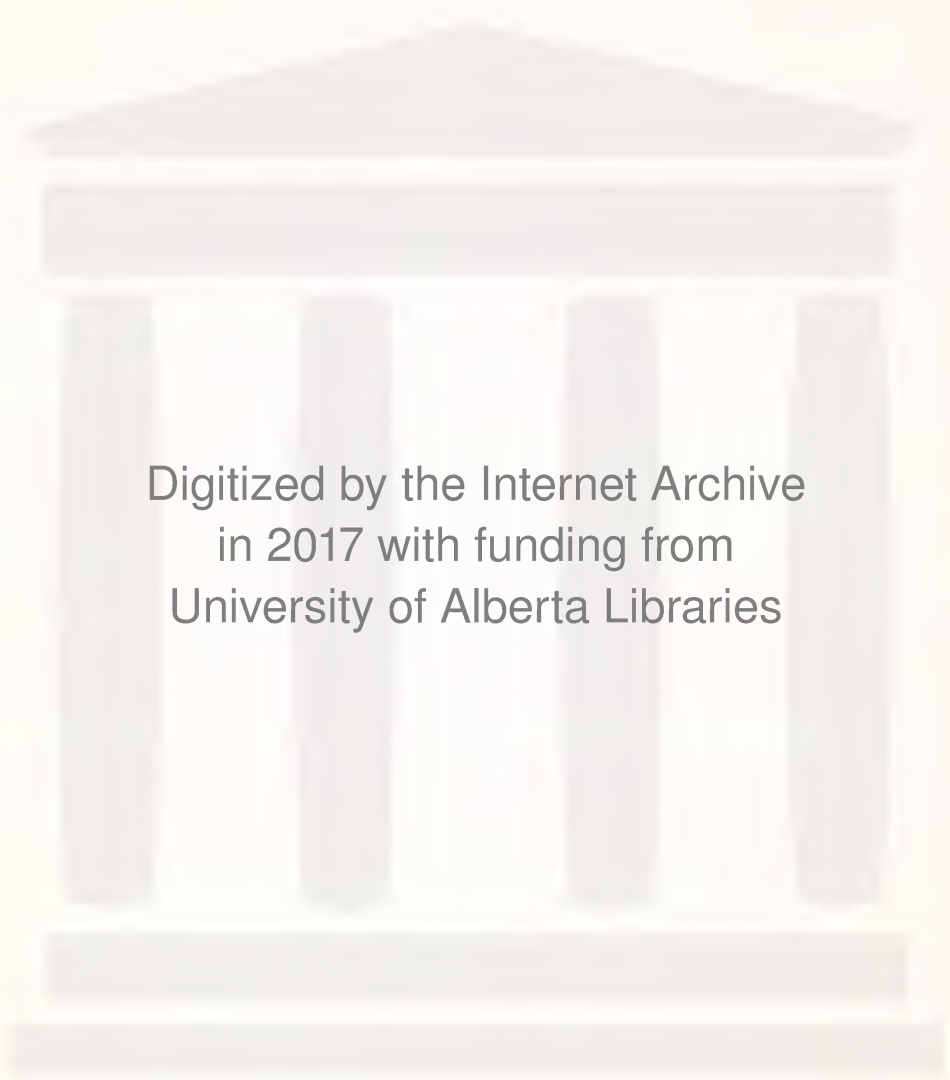
**Suggested activity, discussion, or research.** These suggestions are meant to extend, reinforce, or complement the concepts and processes presented in the text. They are interdisciplinary in nature.

**Worksheets.** These worksheets may be reproduced for use by individual students.

**Workcards.** The workcards may be used in learning centres, or by individual students. They generally pose a question or a statement for further investigation, discussion, or research.

**Picture Cards.** The picture cards are designed to be used in sets to develop comparison or classification skills, or they may be used individually for creative writing, discussion, or research.





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## ORANGE BOOK (1)

# Unit 1: Your Senses

Pages 6-23

### UNIT OVERVIEW

#### Concept Development

Concrete experiences involving seeing, hearing, touching, smelling and tasting are the ways that information and ideas are absorbed by students in the process of developing concepts. As these experiences are collected and combined, thinking and understanding result. The larger the number of direct experiences and the greater the amount of information that children have, the easier it will be for them to build concepts, see relationships and arrive at generalizations.

Before certain concepts can be arrived at, the information being received must correspond with what has already been understood. It is necessary in this unit to check the child's understanding of the concept, or word, as it is introduced and developed.

This unit develops the overall concepts that an object or event can be described in terms of properties that can be determined by using one or more of the senses, and that the degree of similarities and differences in these properties can be perceived, and can be used to distinguish between objects and events. Unit I, "Your Senses", consists of six lessons.

Lesson one, "Seeing", develops the concepts that seeing is a very important way to find out about things; seeing helps us determine certain properties of objects, such as colour, shape and size; and instruments, such as a magnifying glass, are sometimes used to help us see better.

In the second lesson, "Hearing", the concepts developed are that much can be learned about the world by listening; hearing helps us identify objects by their sounds; some properties of sound are loud, soft, high and low; and hearing helps us identify the direction from which a sound is coming.

Lesson three, "Touching", develops the concepts that the sense of touch helps us determine the shape, texture, degree of warmth, and mass of an object; we usually use our hands to touch objects, though we may use other parts of our body; and we feel with our skin.

Lesson four, "Smelling", develops the concepts that we smell odours through our nose; smelling helps us describe properties of things in our environment; and we know smells by having experienced them before.

The sense of smell is best developed by increasing

children's vocabulary for describing smells as they experience them. The concept "sour" for example, has no meaning unless children experience some sour smells.

In the fifth lesson, "Tasting", the concepts are developed that we taste through parts of our tongue called tastebuds; the sense of taste helps us describe some properties of food; and some properties that taste helps us describe are: sour, salty, sweet and bitter.

As with smelling, children have to rely on previous experiences when learning with the sense of taste. For example, the properties of shape, colour, texture and temperature of a lemon could be described by children, using a variety of past experiences with different objects. However, the child's ability to describe its taste will depend on previous experience with the concept (meaning) of "sour".

Lesson six, "Smelling and Tasting", develops the concepts that although taste and smell are separate senses, they are closely related, and that the flavour of a food is a combination of the way it tastes and smells.

#### Process Development

In this unit students *observe* the properties and characteristics of objects using one or more of their senses; they *compare* objects in terms of their properties; they make *inferences* based on their observations and comparisons; and they *communicate* or describe objects orally, on class charts or by pictures. There is also an opportunity to *predict* the outcome of an investigation involving the taste of certain foods.

It is important at this stage to develop in students the ability to describe an object by *quantitative properties* rather than only by name or by qualities of the object. For example, naming a tomato and saying that a tomato tastes "good" conveys little about the tomato itself. Students should identify properties such as round, red, soft, smooth, etc. Students should also be given opportunities to use vocabulary that describes the properties of objects more exactly. These types of observations form the basis of science. Also, the curiosity and interest that students develop in the similarities and differences that they observe offer opportunities for investigations and problem solving.

## Related Units

Environment *Gold Book (2)*  
Sounds Around You *Blue Book (3)*  
Light *Green Book (5)*  
Interacting with Your Environment *Red Book (6)*  
Science: Something People Do *Exploring Matter and Energy. (7)*  
The Human Body: A Study of Yourself *Exploring Living Things. (7)*

## Materials and Advance Planning

The following list includes the materials that a student, or a group of students, will need to carry out the "Finding Out" activities. In some instances, other materials may be substituted for those on the list.

Container such as an oatmeal box or a cardboard bucket; scissors; clear plastic; kitchen wrap; rubber band; warm and cold water; 2 drinking glasses; foods that are hard, such as pretzels; foods that are soft, such as marshmallows; things with a strong odour, such as vinegar, onion, flowers; foods with a variety of smells and tastes, such as pickles, fruits and vegetables.

## TEACHING STRATEGIES

The purpose of the following activities and teaching strategies is to provide you, the teacher, with a wide variety of suggestions, that can be used together with the material presented in the textbook, to help guide your pupils in developing the processes and concepts of this unit.

### Seeing (Textbook, pages 8-9)

#### Mirror Images

- begin by having children look in a mirror and tell what they see
- if mirrors are not available, students could pretend to be a mirror and could describe the people looking at them
- the children must be trained through discussion and experience to use their eyes effectively. For example:
  - What do you look like?
  - Look at your face. Where are your eyes?
  - What do your teeth look like? How many teeth do you have?
  - How long is your hair? How is it combed?
  - What happens to your face when you smile? Laugh? Frown?
  - What happens to your face when you chew?
  - Do you have any freckles?
  - Look carefully at your hand. What do you see?
  - When your arms are straight at your sides, to what point do your fingertips reach?

You may wish to have your students record their observations on "Your Senses, Worksheet 1".

- working in pairs, the children could take turns mirroring each others' actions and expressions

### Sightless Wandering

- having the children function without using their eyes is a good way to emphasize the importance of sight
- working in pairs, the children take turns being the leader and the blindfolded person. The leader must verbally direct the blindfolded person around the room without touching the person at all.
- for variation, members of the group take turns giving directions in order that a blindfolded person may reach a specific destination or find a specific object.

### Hearing (Textbook, pages 10-11)

- children are born with the ability to hear, but they must be trained to listen effectively
  - many kinds of experiences will lead the children to be able to listen discriminately
    - tapping rhythms for the children to repeat
    - singing or playing combinations of high and low notes, and having the children repeat the pattern of the notes by singing or by raising or lowering their hands
    - unison clapping to indicate a musical beat
    - recording sounds that are common to the home, school, or community, and having the children identify each sound
    - sending the children on a short walk around the school to tape record the sounds around them.
- The tapes could then be played back for the class to pick out and identify various sounds

You may wish to use "Your Senses, Workcards 1.1 to 1.12", to help your students discriminate between the sounds that are around them.

### Topics for class discussion:

- the difference between noise and sound
- Do any noises irritate you?
- What is the difference between talking and shouting? Why would a person shout?
- What things make soft sounds and what things make loud sounds?
- If you could not hear, how would you know:
  - when to get up in the morning?
  - when to come into the school each morning?
  - if a baby was crying?
- If you could not hear, how could people tell you things?

### Touching (Textbook, pages 12-15)

#### Touching Experiences

- in addition to the tactile experiences suggested in the text you might consider the following activities:

#### Matching

- have the child match pairs of tactile cards
- after blindfolding the child, place the cards face up in front of the student



- the child chooses one card, and by feeling the surfaces of the other cards, finds the correct mate
- the game ends when all the cards have been matched into pairs
- some suggestions for your tactile cards are:
  - sandpaper, fine and coarse
  - velvet
  - satin
  - corrugated cardboard
  - terry cloth
  - waxed paper
  - cellophane paper
  - fur fabric or nylon pile
  - lace or net
  - burlap
  - mesh screen
  - tin foil
  - heavy tweed
  - leather or suede
  - string or twine
  - corduroy or ribbed knit

### Touch and Feel

- working with a very small group of blindfolded children, the teacher either:
  - rubs articles on each child's face
  - places an article into each child's hand
  - passes a bowl, containing something to feel, to each child
- at the same time, the teacher asks leading questions such as:
  - How does this feel?
  - How does this make you feel?
  - What does this make you think of?
  - Where might you find this?
  - Could you eat this?
- some suggested substances are:
  - cooked spaghetti
  - a raw tomato cut in half
  - play-dough or plasticene
  - an orange segment
  - mud
  - dry cereal
  - sand
  - cotton balls
  - wet sponge
  - instant coffee
  - jello
  - raisins
  - marshmallows
  - bath oil beads
  - shaving lather
  - whipping cream
  - peanut butter

### Discussion Ideas

- after some tactile experiences, help the children

compile a list of words which describe the way things feel

- try to include words such as spongy, hard, silky, dull, furry, prickly, sticky, smooth, rough, soft, bumpy, sharp and fluffy
- to promote discussion and creative thinking, you might ask questions such as:
  - What would you make *spongy* so it would be more *fun*?
  - What would you make *dull* so it would be *safer*?
  - What would you make *silky* so it would be *nicer*?
  - What would you make *hard* so it would be *tougher*?
  - What would you make *prickly* so it would be more *unpleasant*?
  - What would you make *furry* so it would be *warmer*?

### Texture Collages

- ask the children to bring from home suitable scraps and discards
- individual or group collages can be made displaying contrasting or similar surface textures
- the only "musts" are strong glue and a stapler

### Fingerpainting

- fingerpainting is always fun and is a form of expression and tactile experimentation
- encourage the children to use all parts of their hands and arms
- by adding granular substances such as sand, coarse salt, or rice the variety of textures can be increased
- when fingerpainting is done to various types of music, the results often are dramatically different

### Smelling (Textbook, pages 16-17)

As an extension of the activities in the textbook, you may wish to develop further your students' *observation* and *inference* skills by using "Your Senses, Workcards 2.1 to 2.12".

### Tasting (Textbook, pages 18-19)

- have the children cut out pictures showing a wide variety of foods
- when you have a large and varied collection of pictures it can be used for:
  - vocabulary building
  - developing a descriptive word list for story writing
  - sorting the foods into various sets such as:
    - sweet, sour, salty, bitter
    - wet, dry
    - soft, hard
    - soggy, sticky, crunchy, crumbly
    - likes, dislikes

---

— following the sorting activities groups of children may be assigned to:

- record and graph their findings on large class-size charts
- create collages which include particular types of foods
- make booklets on their type of food
- write an advertisement for one food item
- look in newspapers and flyers for store advertisements about foods in their category

### Snack Time

— it might be fun to assign the type of snack that the children could bring each day for a week. For example, one day might be designated "crunchy day".

### Topics for thinking, discussing, writing and illustrating:

- What if all fruits were sour?
- What if ice-cream tasted salty?
- What food would you make sweeter?
- What foods are bitter? Do you like them?
- What crunchy foods do you like?
- Name some sticky foods.
- What would you make gooey so it would be more fun to eat?

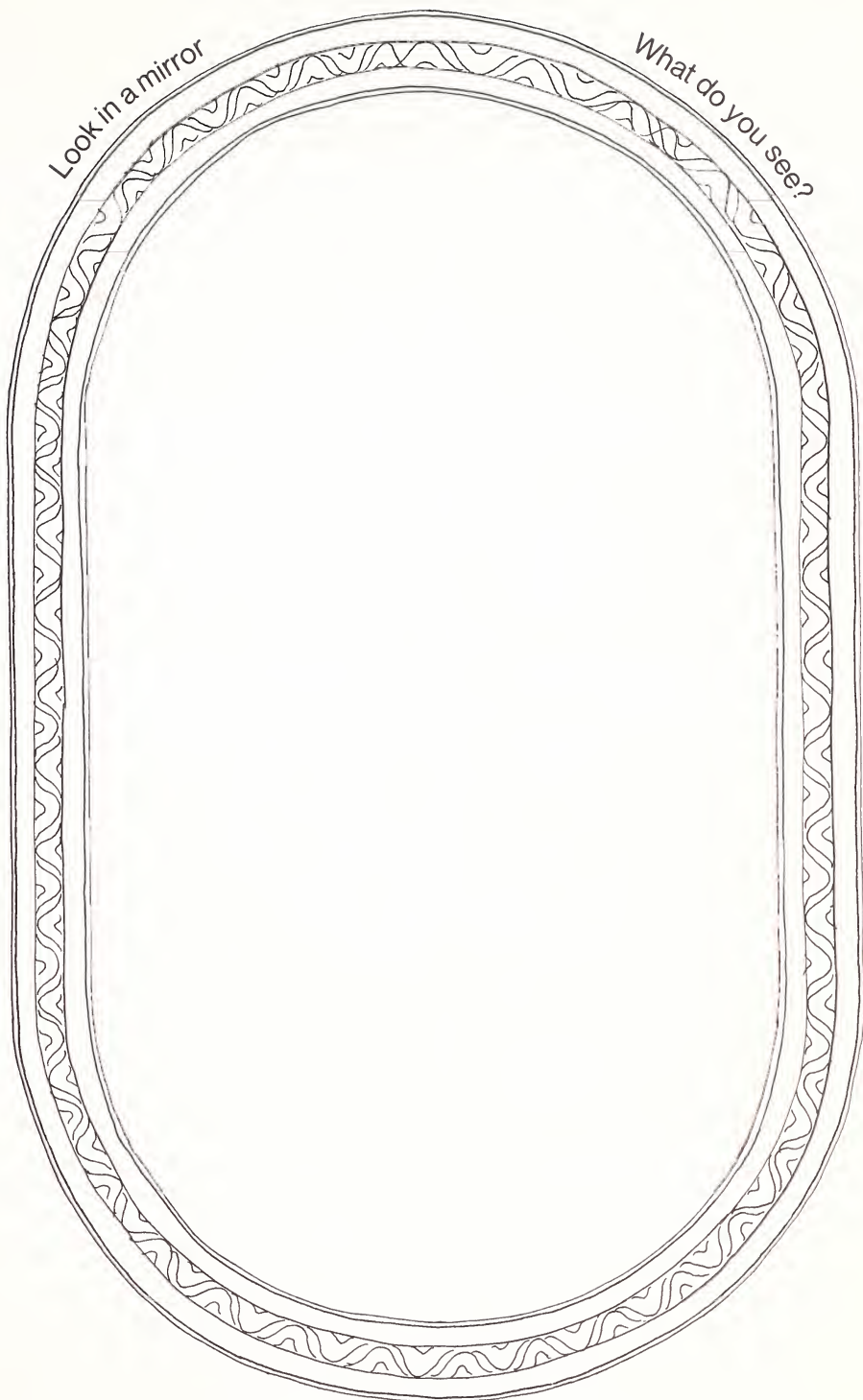
— Name some crumbly foods.

### Ice-Cream

- Children love ice-cream. Why not have the children create a drawing, story, or poem about:
  - their favourite ice-cream
  - the day when they took a bite and something terrible happened
  - the talking ice-cream cone
  - an ice-cream dream
  - a day when they ate too much ice-cream
- when completed, "Your Senses, Worksheet 2" can be cut out and displayed or made into a booklet.

### Your Five Senses

- a booklet could be made by students, with a page for each of the five senses studied in this unit. You may wish to use "Your Senses, Worksheets 3, 4 and 5" to make the booklet
- the children are asked to use their imaginations to complete each page
- the children's thoughts may be expressed through dictation to you, or students may print their story, depending on each child's ability
- the children should illustrate each page of this booklet







1.



Sit in the corner of the classroom.  
What do you hear?

2.



Stand at a busy street corner.  
What do you hear?

3.



What sounds would you  
hear at the zoo?

4.



What sounds would you hear  
in the kitchen?

5.



Go out to the playground at  
recess. What do you hear?

6.



What would you hear on  
a stormy night?





7.



What sounds would you hear  
in a carpenter's shop?

8.



What sounds can you make  
without talking?

9.



What sounds do you like?

10.



What sounds are very loud?

11.



What is the quietest thing  
you know?

12.



What sounds does a dog make  
to tell you things?



1.



### SMELLING

Where would you go to  
smell a rose?

2.



### SMELLING

Where would you find things  
that smell delicious?

3.



### SMELLING

List some foods with very  
strong odors. Which of these  
do you like to eat?

4.



### SMELLING

Stand in a garden. What  
can you smell?

SMELLING

Where would you go to  
smell a flower?

SMELLING

Where would you go to  
smell a flower?

SMELLING

Let some kids know  
strong about the way  
to you like it.

SMELLING

Stand in a garden. What  
can you smell?



5.



**SMELLING**

Where would you go to  
smell popcorn?

6.



**SMELLING**

Stand in the lunchroom.  
What do you smell?

7.



**SMELLING**

What might you smell at a  
birthday party?

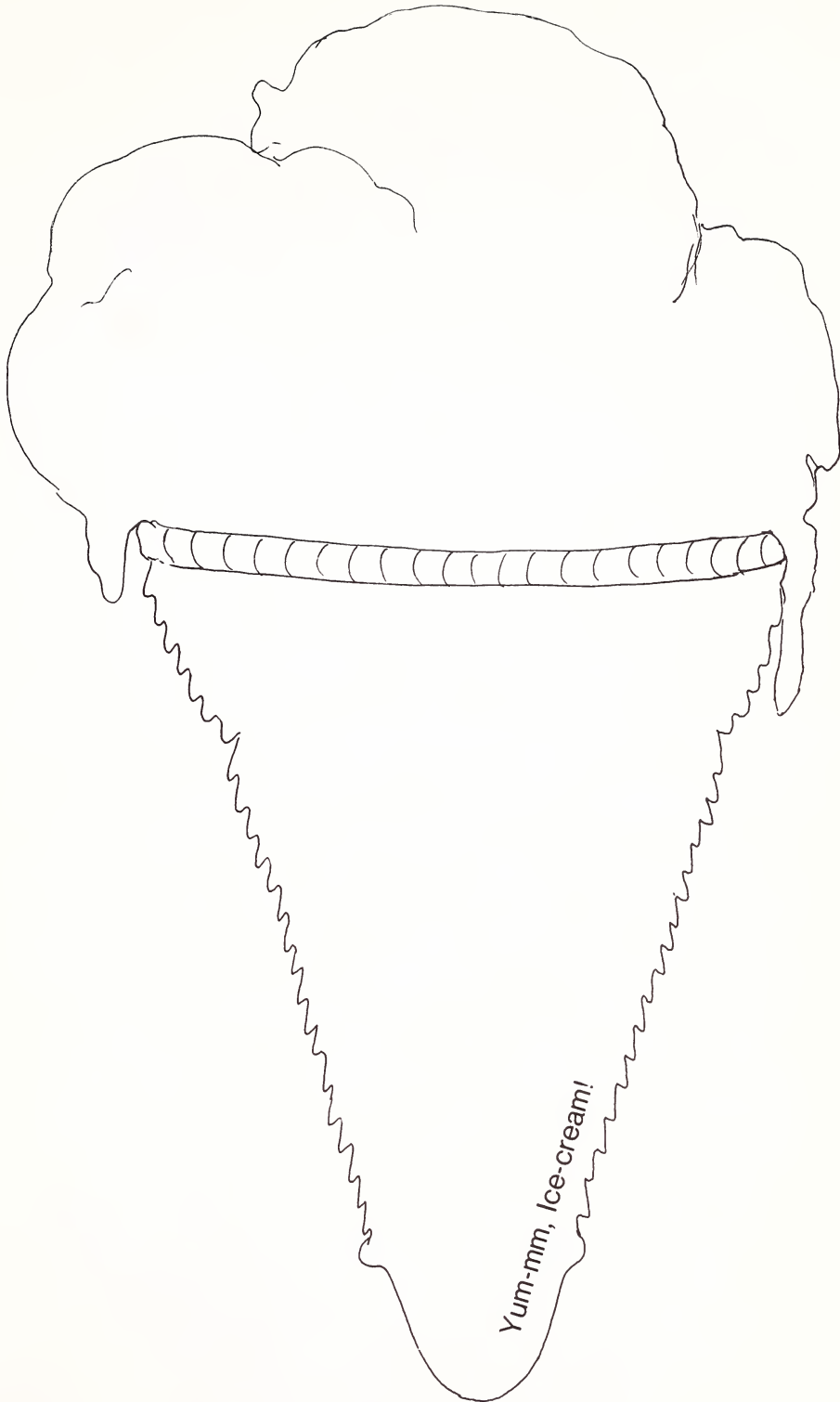
8.



**SMELLING**

What might you smell at  
a barbecue?











My hands



Five Senses





My eyes

---



My nose



My eyes



My nose



My ears

---



My mouth and tongue





## ORANGE BOOK (1)

# Unit 2: Living Things

Pages 24-47

### UNIT OVERVIEW

#### Concept Development

Children naturally have a sensitivity toward living organisms. They try to understand animals, and they show an interest in plants and flowers. Children also frequently wonder whether a thing is living or nonliving.

In this unit, children begin by distinguishing between living and non-living things. The concept that a living thing carries out certain functions that a non-living thing does not, is then introduced. This is followed by children distinguishing between the two kingdoms of living things: the animal kingdom and the plant kingdom. The concept that plants and animals have certain needs in order to live and grow, just as people have certain needs, is developed. These concepts are presented in a series of eight lessons.

There are throughout the unit some overlying concepts that can be introduced and developed. Children will become aware of the great *variety* of living organisms, and that within this variety there are *similarities and differences*. They will realize that animals and plants live in certain *environments*, and they will recognize the *interdependence* that is necessary between living things and the physical environment, in order for organisms to live and grow.

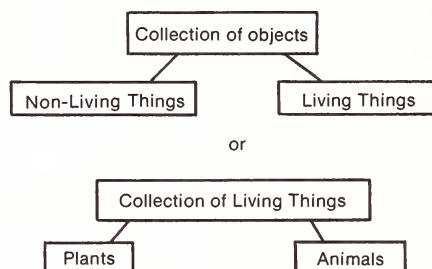
The students should be given many and varied opportunities in this unit to develop their concepts of "Animals", "Plants", "Living Things", and "Non-Living Things", by observing and comparing things in the school-ground or neighbourhood, by using pictures, film or filmstrips, by discussion, or by games.

#### Process Development

In this unit, students *observe* the properties of living and non-living things; they *compare* the similarities and differences between the properties they observed; they use the similarities and differences to *classify* things; they make *inferences* from their observations and comparisons and they carry out some *systematic experiments* to observe plant growth and the needs of plants and animals. The experiments involve controlling one or two *variables*. Students *communicate* or describe their "Finding Outs" with pictures, through discussion and through class charts and displays.

This unit offers many opportunities for introducing and developing *classification skills*. Classification is a

grouping process designed to give order to collections of objects or events. Classification schemes can be used to identify objects of events, or to demonstrate similarities, differences and interrelationships in a collection of objects or events. The grouping is based on observable characteristics and divides the collection into subsets which are more homogeneous than the collection. At this level, the students should be able to develop single-stage classification systems—where the classification results in two subsets. For example:



These classification systems could be developed and recorded on class charts, by using pictures, or in writing.

#### Related Units

Food for Animals and You *Gold Book (2)*  
Environment *Gold Book (2)*  
Seed Plants *Blue Book (3)*  
Animal Behaviour *Blue Book (3)*  
Plant Growth and Behaviour *Brown Book (4)*  
Animals and Their Environment *Brown Book (4)*  
Small Living Things *Green Book (5)*  
Plant and Animal Life Cycles *Red Book (6)*  
Ecosystem Earth *Red Book (6)*  
Ecology: Interaction in the Environment *Exploring Living Things (7)*  
Biology: The Study of Living Things *Exploring Living Things (7)*

#### Materials and Advance Planning

The following list includes the materials that a student, or a group of students, will need to carry out the "Finding Out" activities. In some instances other materials may be substituted for those on the list.

Living and non-living things that can be found on the

schoolground or in the neighbourhood (weeds, insects, rocks, sand, water, etc.), several kinds of seeds, milk cartons, (or other containers), soil, photos of your students when they were younger, three plants of the same kind and size, large cardboard box, paper, marker, tape, small animals (gerbils, hamsters, fish or birds), proper food and shelter for the animals.

Select your animals and establish them in the classroom before you begin this unit. Involve students in the proper care and maintenance of the animals and their shelters. Also, plant seeds in advance of the unit, so that you have plants ready for the "Finding Out" on p. 41.

## TEACHING STRATEGIES

The purpose of the following activities and teaching strategies is to provide you, the teacher, with a wide variety of suggestions, that can be used together with the material presented in the textbook, to help you guide your pupils in developing the processes and concepts of this unit.

### Picture Cards (Living Things 1.1 — 1.24)

- Picture Cards are to be used in directed activities which will further the children's understanding of the concepts presented in this unit
- the cards can be used in group lessons and in individual exploratory activities
- by working with these cards, the children will reinforce the processes—observing, comparing, communicating, classifying, and experimenting—which are presented in the LIVING THINGS unit
- children learn by doing, therefore those who are able to manipulate the cards in some manner will have a feeling of accomplishment, and those who are unable to manipulate the cards will gradually learn by observing the other children
- the following activities will enable you to integrate all areas of the curriculum with the science concepts and processes of this unit

### Sorting Activities

- the children's free handling of the Picture Cards will give you insight into each child's *classification* skills
- the Picture Cards can be sorted into the following classifications:
  - living; non-living
  - plants; animals
  - things that can move alone; things that cannot move alone
  - things that grow; things that do not grow
  - things that have babies; things that do not have babies
  - things found on land; in the sea; in the air
  - things you can eat; things you cannot eat

- things that are large; things that are small
- things that have eyes; things that do not have eyes
- things that make a noise; things that do not make a noise
- things that can change; things that cannot change

### Similarities and Differences

- choose two or three Picture Cards and ask the children to tell how they are alike and how they are different
- depending on the combination of Picture Cards chosen, the similarities and differences may be very obvious or may be obscure, which would require more skill in observing, in comparing and in communicating

### Ordering Activities

- discussion about the pictures would precede the following:
  - placing the Picture Cards in alphabetical order
  - placing the Picture Cards in order according to size from smallest to largest
  - placing the Picture Cards in order according to size from largest to smallest
  - placing the Picture Cards in order according to personal preference
  - placing the Picture Cards in order according to usefulness
- you place a few cards in a series, remove and shuffle them, and then direct a child to repeat the same order

### Pantomime

- pantomime could be introduced using a class discussion, or by allowing for spontaneous exploration of movement by the students
- you could hold up one Picture Card and ask the group to act out the appropriate movements
- a Picture Card could be shown to only one student and the child could be asked to act out the movements while the rest of the group guesses which Picture Card is being portrayed

### Stick Puppets

- Stick Puppets, which are made by attaching a Picture Card to a ruler or stick, can be used in the following ways:
  - two children use stick puppets in a conversation between the stick puppets
  - in impromptu dramatics
  - in participation games where children will hold up their stick puppets, if they fall into specific categories that are mentioned by the teacher. For example, "If you are living and have the long a sound".

---

### Expressions

- the children could draw, tell or write a story about a particular Picture Card
- for variation, the children could be asked to incorporate two or three selected Picture Cards into a story
- the children could be asked to respond to questions such as:
  - "If I gave you this snake, what would you do?"
  - "Could this jogging shoe be helpful to you?"
  - "Would you like this robot and why?"
  - "How would you make this racing car better?"
- the children could complete a class chart which displays one Picture Card and a leading question

### Following Directions

- in a group lesson, you could have individual children carry out directional instructions such as:
  - "Pick up the third and the fifth Picture Card."
  - "Give the largest animal to Tony."
  - "Put the banana behind the guinea pig."
  - "Take the elephant and hop eight times."
  - "Take the non-living thing that begins with t and put it beside the living thing that begins with g."

### Card Selections

- a child could select a living thing from the Picture Cards and trace its life cycle
- a child could select a Picture Card, trace the line drawing onto a separate piece of paper, and draw a picture which shows the environment of the living thing or object chosen
- a child could select a Picture Card, go to the library, and find a related book. The book could then become part of the classroom library, be read to the

class during story time or be used as a class reference book

- a child could match the Picture Cards with their corresponding name cards. A picture dictionary could be used if necessary
- a child could select a Picture Card and then walk around the classroom gathering objects that begin with the same initial consonant. For example, the Picture Card of a parrot could lead a child to pick up a pen, a pencil, a piece of paper, a pin, a paper clip, a painting, a picture, a puppet, a potted plant, a pointer or some paste.

### Who Am I?

- a game could be played where children must receive clues in order to guess which Picture Card has been attached to their backs
- the game could be played in different ways:
  - two children could alternate in giving and receiving clues
  - in a group situation, children could take turns giving clues to one Picture Card wearer. The child whose clue leads to the correct guess becomes the next Picture Card wearer.
- all children in the group could have a Picture Card attached to their backs. For a set time period, the children could circulate, seeking clues to their identity.

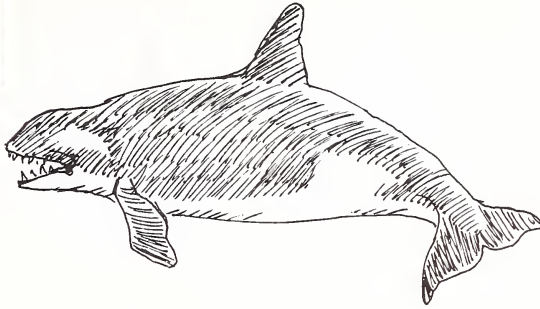
### TEAR OUT SHEETS

- "Living Things, Worksheets 1, 2 and 3" could be completed by having the children draw pictures, cut and paste pictures from magazines, or write appropriate statements or stories





whale



Living Things

Picture card 1.1

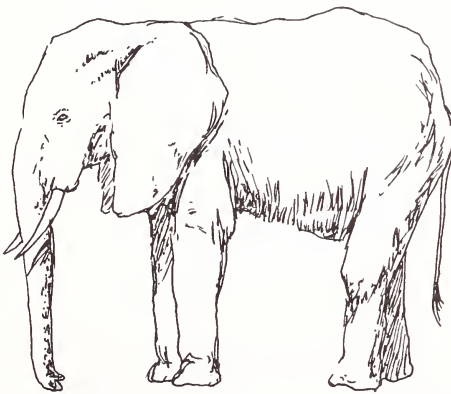
dinosaur



Living Things

Picture card 1.2

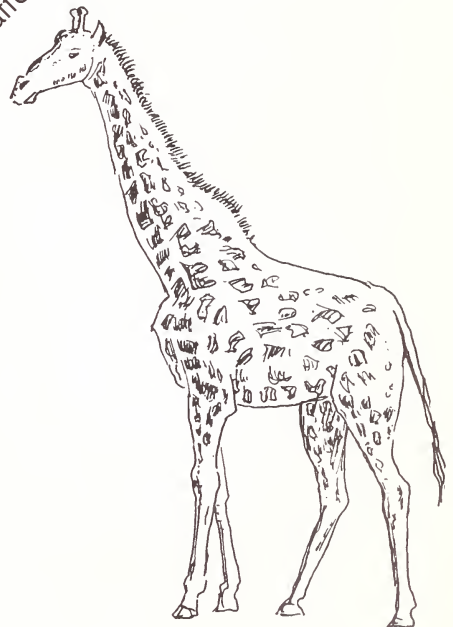
elephant



Living Things

Picture card 1.3

giraffe

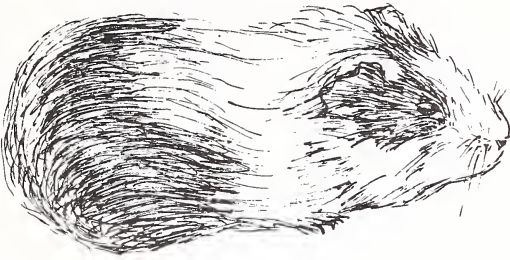


Living Things

Picture card 1.4



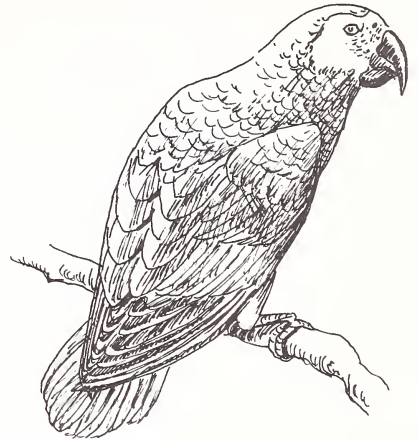
guinea pig



Living Things

Picture card 1.5

parrot



Living Things

Picture card 1.6

snake



Living Things

Picture card 1.7

sunflower

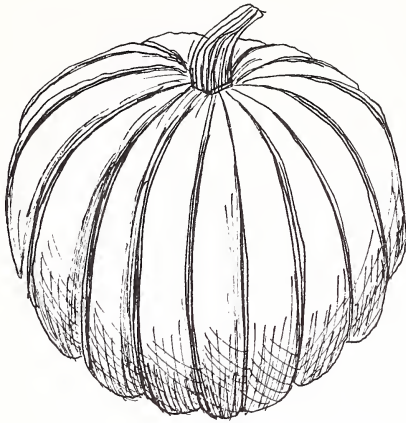


Living Things

Picture card 1.8



pumpkin



Living Things

Picture card 1.9

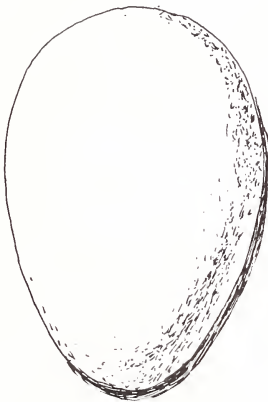
pirate



Living Things

Picture card 1.10

egg



Living Things

Picture card 1.11

jogging shoe



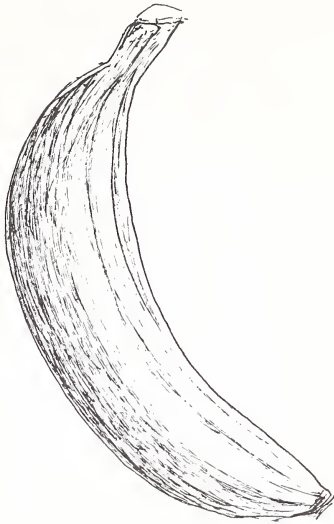
Living Things

Picture card 1.12





banana



Living Things

Picture card 1.13

crab



Living Things

Picture card 1.14

hockey player



Living Things

Picture card 1.15

baby

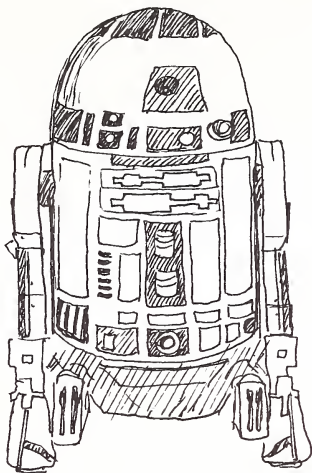


Living Things

Picture card 1.16



robot



Living Things

Picture card 1.17

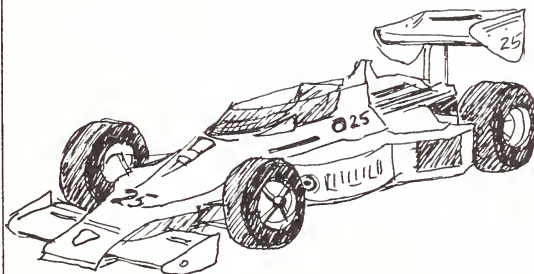
telephone



Living Things

Picture card 1.18

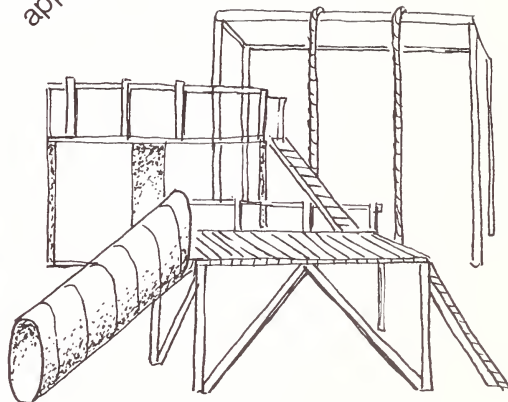
racing car



Living Things

Picture card 1.19

climbing  
apparatus

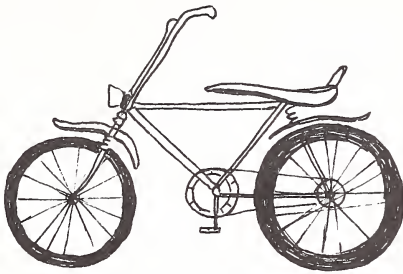


Living Things

Picture card 1.20



bicycle



Living Things

Picture card 1.21

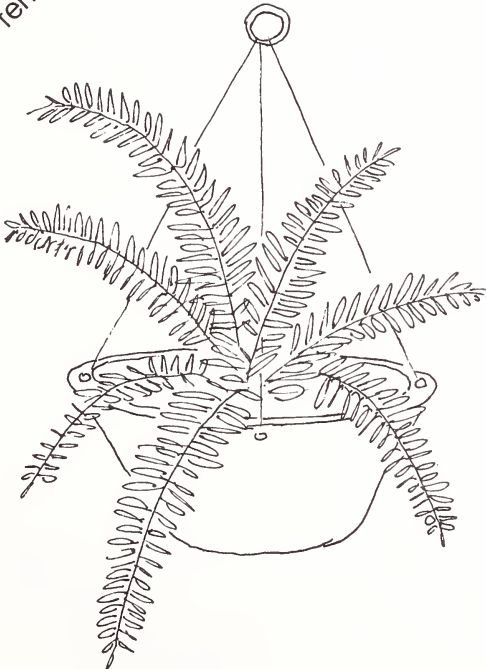
soccer ball



Living Things

Picture card 1.22

fern



Living Things

Picture card 1.23

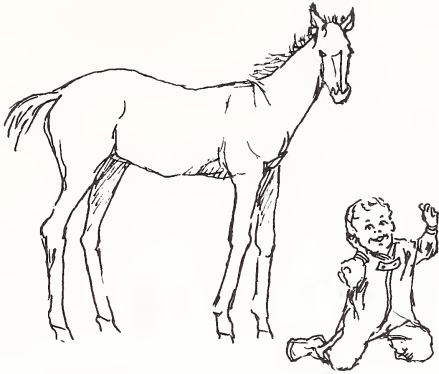
mushroom



Living Things

Picture card 1.24



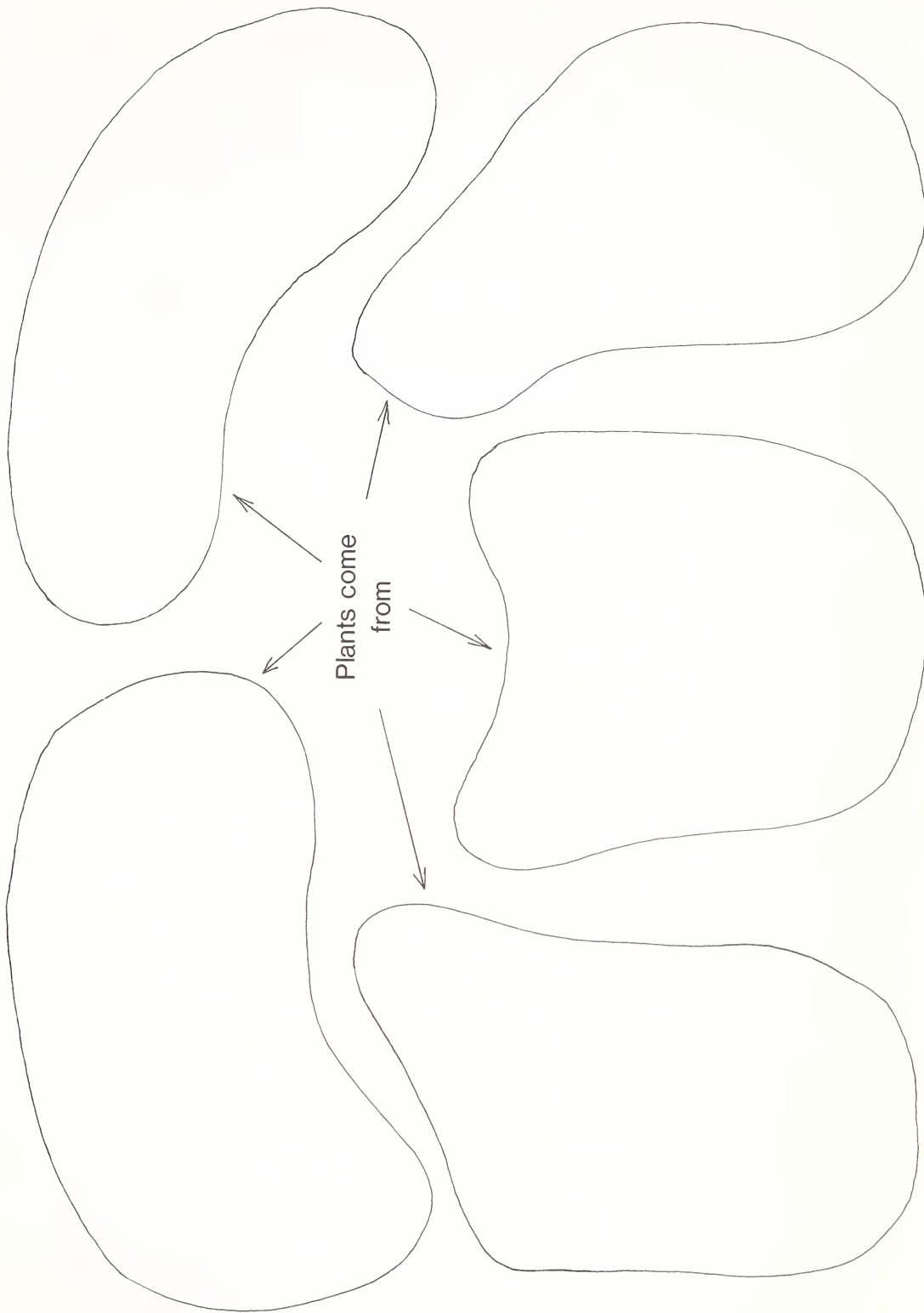


Babies need...

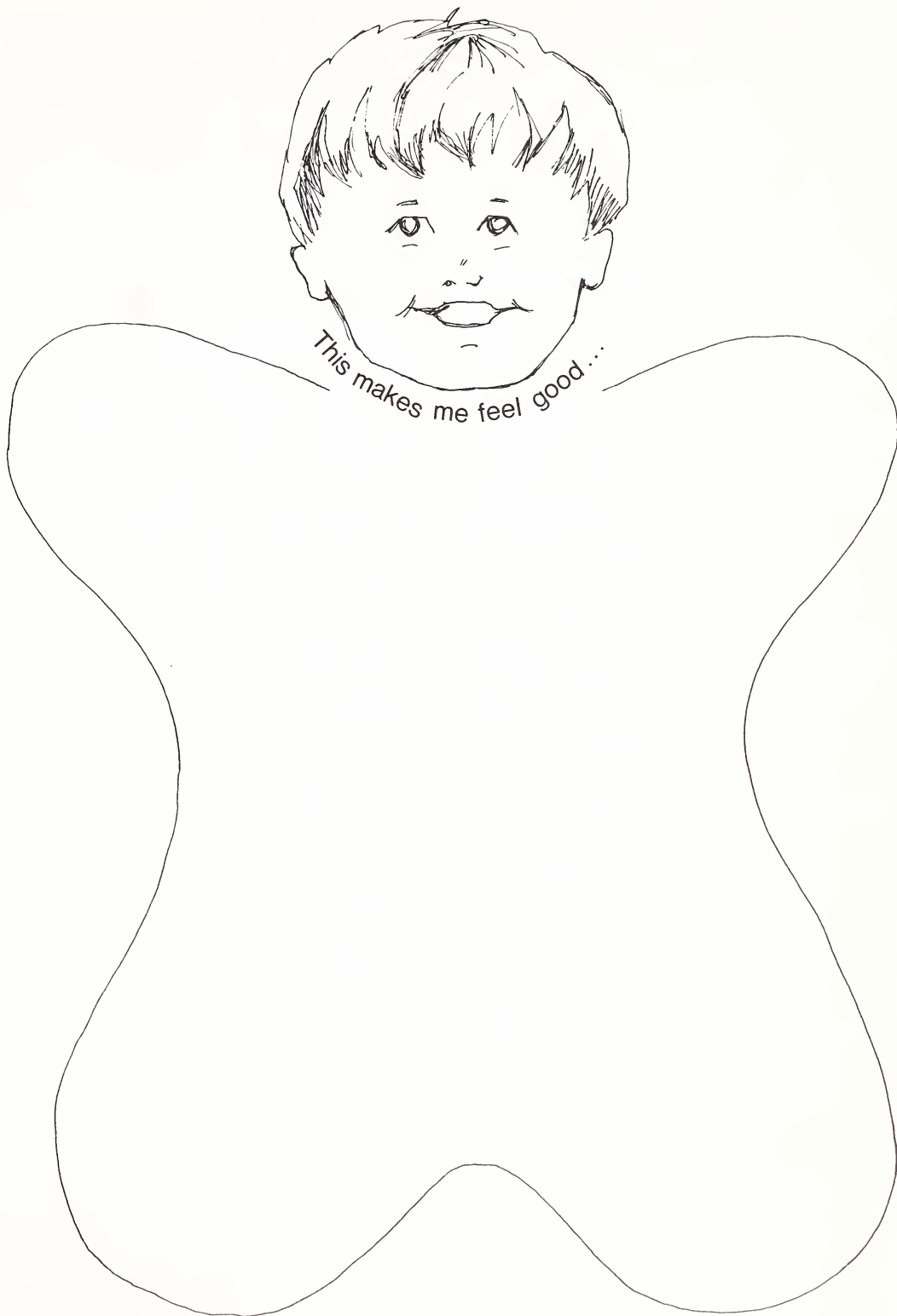




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# ORANGE BOOK (1)

## Unit 3: Sorting

Pages 48-71

### UNIT OVERVIEW

#### Concept Development

Sorting activities form the basis for developing classification skills. Early in their conceptual development children begin to distinguish patterns of properties in objects. The words used to define the shape and properties are then developed. The purpose of this unit is to develop in children the ability to *describe and compare* objects more precisely, and to see *inter-relationships* between objects.

Unit 3, "Sorting," consists of nine lessons. The first six lessons are designed to help children learn to sort objects having only one difference. The last three lessons are designed to help students learn to sort objects having two differences.

The first and second lessons, "How things are alike" (page 50) and "How things are different" (page 51), develop the concept that objects can be sorted by *likenesses or by differences*. Some of the properties used to distinguish likenesses and differences are *colour, size, shape, and texture*. These properties are then dealt with individually, and in more depth, in the third through sixth lessons, "Sorting by colour" (pages 52-53), "Sorting by size" (pages 54-55), "Sorting by shape" (pages 56-59) and "Sorting by feeling" (pages 60-63).

The seventh lesson, "Sorting by two differences" (pages 64-65), provides students with experiences that develop the concepts that more than one property can be used to sort objects, that different objects may have a common property and that some objects may fit into more than one classification scheme at the same time. Sorting and comparing skills are applied to the students' environment in the eighth lesson, "Sorting for selling" (pages 66-67), and the ninth lesson, "Sorting at home" (pages 68-69).

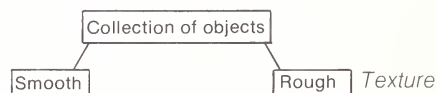
#### Process Development

In this unit students *observe* the properties of objects; they *compare* the similarities and differences between the properties of the objects they observed; they use these comparisons to *classify* objects, and they *communicate* their investigations through discussion, with class charts and graphs, and using pictures and displays.

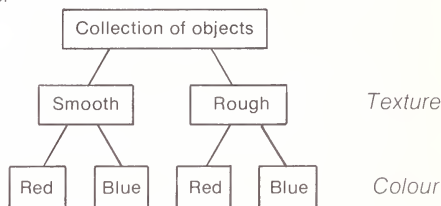
It is important to have children observe the properties

of the objects carefully. In order to be precise in their descriptions, students need often to use and hear words that describe properties. Rather than asking students to "Place it over there", you may wish to be more precise in your own everyday classroom instructions by asking students to "Place the yellow, soft-covered book on the round, brown table".

There are many opportunities for developing *classification skills* in this unit. You may wish to start by having students divide their objects into two subsets, by using one observable property. This is a single-stage classification system. For example:



You may then wish to have them develop two-stage classification systems, where they sort the first stage into a further subset, by using another property. For example:



#### Related Units

Living Things *Orange Book (1)*

Measuring *Gold Book (2)*

Rocks and Soil *Gold Book (2)*

Matter and You *Red Book (6)*

Science: Something People Do *Exploring Matter and Energy (7)*

Biology: The Study of Living Things *Exploring Living Things (7)*

#### Materials and Advance Planning

The following list includes the materials that a student, or a group of students, will need to carry out the "Finding Out" activities. In some instances other materials may be substituted for those on the list.

Objects of different colours, coloured paper, scissors, stencils of various shapes, a variety of rough and smooth objects, a variety of hard and soft objects, small toys, shoes.

## TEACHING STRATEGIES

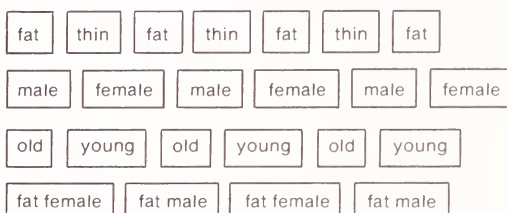
The purpose of the following activities and teaching strategies is to provide you, the teacher, with a wide variety of suggestions that can be used together with the material presented in the textbook, to help guide your pupils in developing the processes and concepts of this unit.

### People Sorting

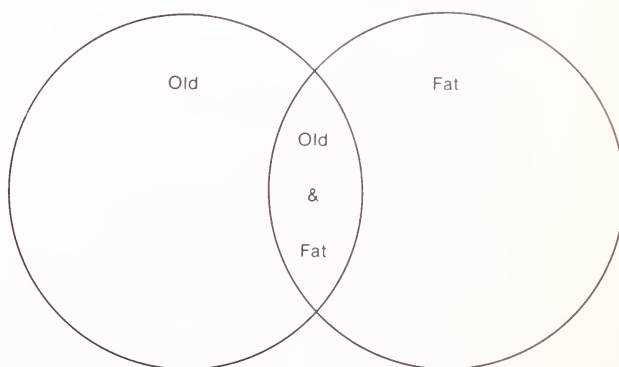
- the text suggests a wide variety of objects for sorting and many ways to sort them
- an alternative that really appeals to the children is physically to be involved in the sorting by being the “objects” to be sorted
- these “objects” are readily available, require no teacher preparation, and are effective in making the children aware of their individual likenesses and differences
- the children can be sorted in a myriad of ways. Knowing the individual differences in your class, you will be able to apply these and think of many more:
  - girls, boys
  - colour of hair
  - colour of eyes
  - people who wear glasses, people who do not
  - people wearing running shoes, people who are not
  - people wearing something red, people who are not
  - people who have zippers, buttons, belts, shoes that buckle
  - people who have birthdays in January, February, March, etc.
  - people who live in a house, people who live in an apartment
- a high level of interest will be carried through when the results from the sorting activities are recorded and graphed as:
  - picto-graphs
  - bar graphs
  - line graphs
  - matching graphs
- Following the above sorting activities, have a general discussion of the characteristics which accompany broad age groups in people. The children should then be able to complete “Sorting, Worksheet 1”.

### People Picture Cards

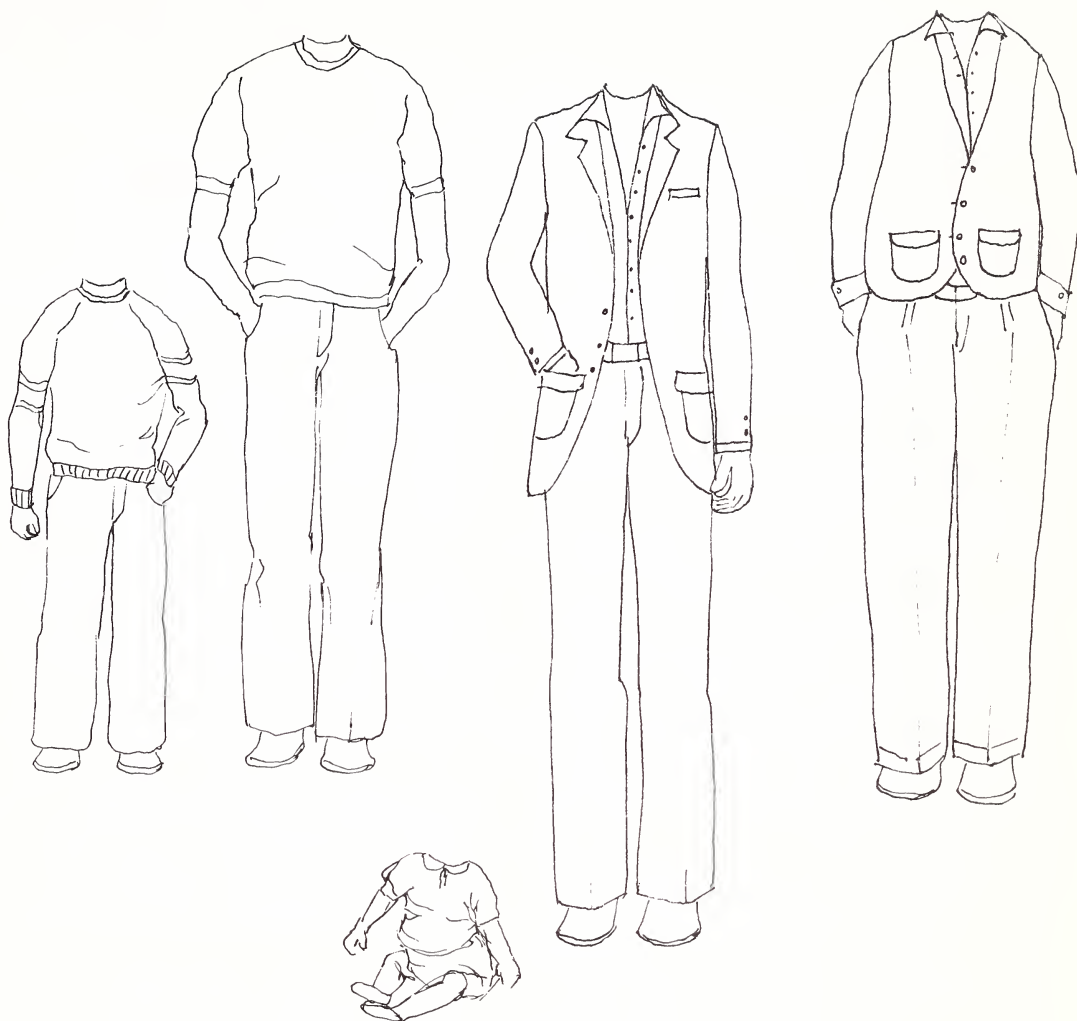
- further sorting activities can be carried out using People Picture Cards
- People Picture Cards can be made by pasting magazine or newspaper pictures of people showing certain characteristics onto index cards or card-board
- Some characteristics that these cards can show are:
  - fat, thin, male, female, child and adult
  - the Picture Cards can be sorted according to one, two or three properties. For example, male, fat male, fat adult male.
  - the People Picture Cards can be used for making pattern chains, such as:



- the children's explorations can be furthered by leading them to create Venn Diagrams using two hoops. The children may even discover that two properties can overlap.









## ORANGE BOOK (1)

# Unit 4: Light and Shadows

Pages 72-95

### UNIT OVERVIEW

#### Concept Development

Activities with light and shadows provide a good way to develop an understanding of the concept of *cause and effect relationships*. When a lamp is switched on there is light. The size of a shadow is dependent on how near or far the object is from the light source. The shape, size and position of shadows caused by sunlight will be effected by the position of the sun.

Unit 4, "Light and Shadows," consists of eight lessons. These lessons are designed to help students understand the concepts that there are many sources of light, that some of these light sources are natural and others are artificial, that shadows are formed when an object blocks the passage of light from a light source, and that there is a number of conditions that will effect the shape and size of the shadow.

"Light," the first lesson (pages 74-75), helps students learn about the many kinds and sources of natural and artificial light. Solar, thermal, chemical and electrical light are some of the more familiar light sources. Children will also indirectly be introduced to the concept that a light source is necessary in order to see an object.

The second lesson, "Shadows" (pages 76-79), introduces children to the concept of shadows and how they are formed. The formation of a shadow requires a light source, an object that blocks the light, and a surface on which the shadow can appear. The relationships of the real objects to their shadows is also developed.

The third through eighth lesson help clarify and expand the students' concept of shadows. An understanding of the relationship of the object's shape to its shadow, and the relationship of the change in size, shape or location of the shadow to the position of the object or light source, is developed. These lessons are "Moving shadows" (pages 80-81), "Finding the light" (pages 82-85), "Shadows in the morning" (pages 86-87), "Shadows in the afternoon" (pages 88-89), "Shadows at noon" (pages 90-91), and "Changing shadows" (pages 92-93).

#### Process Development

In this unit, students have many opportunities to *observe* the cause and effect relationship between light and shadows, they make *inferences* from their

observations, they *use spatial relationships* to observe and describe their "Finding Outs", and they *communicate* their investigations through discussion and by using pictures and charts.

In the "Finding Out" on page 79, students are able to carry out an *experiment*. Experimentation is the process of designing and carrying out procedures to obtain reliable information about interrelationships between objects and events. In this experiment, students investigate "How the distance from a light source changes the shadow of an object."

Discuss with your students the procedures for experiment:

1. What is the *problem* being investigated?
2. What are some things (*variables*) that may influence the experiment—distance from light source or screen; sharpness of shadow; brightness of shadow; size of shadow, etc...?
3. What are ways to *carry out* the experiment to *control* these variables, and to *collect data*?
4. After carrying out the experiment, what can one *interpret* from the observations and the data?

*Using spatial relationships* is another skill that is used in many of the "Finding Outs" in this unit. This skill involves students perceiving and describing shadows or light sources in terms of their shape, motion, position or location.

#### Related Units

Time *Orange Book (1)*

Spaces and Places *Orange Book (1)*

Measuring *Gold Book (2)*

Location, Motion, and Force *Blue Book (3)*

Watching the Sky *Brown Book (4)*

Light *Green Book (5)*

#### Materials and Advance Planning

The following list includes the materials that a student, or a group of students, will need to carry out the "Finding Out" activities. In some instances other materials may be substituted for those on the list:

Light source, heavy paper, stencils, scissors, opaque objects, sheet, screen or blank wall, an overhead light (not fluorescent), cardboard, modelling clay, marker.

#### TEACHING STRATEGIES

The purpose of the following activities and teaching

strategies is to provide you, the teacher, with a wide variety of suggestions that can be used, together with the material presented in the textbook, to help guide your pupils in developing the processes and concepts of this unit.

### Shadows (Light and Shadows 1.1 to 1.12)

- using pictures in other units in the textbook, the children can be asked to identify the source of the shadow, the cause of the shadow and, where possible, the time of day.
- you may wish to have students create a story around the shadow that is shown in one of these pictures

### Discussion Questions

- the following thought-provoking questions may be used in group discussions
  - Can you tell someone's size from their shadow?
  - Could you see a person's shadow without seeing the person?
  - What things can make shadows?
  - How could you make funny shadows?
  - What do you need to make shadows?
  - Can clouds make shadows?
  - Is there anything that never makes a shadow?
  - How do shadows move?

### Shadow Mimes

- as a variation to the "Finding Out" on page 78 of the text, have the children take turns miming teacher suggested animals or actions by using shadows. The rest of the class tries to infer the animal or action from the shadow
- some of the suggested action categories for the children to choose from could be:
  - household chores
  - playground activities
  - animals
  - occupations
- or you may whisper a specific action to the child,

which the student then performs

### My Shadow

- this game is to be played out of doors and will help the children to understand the concept "A person can tell which direction the light is coming from by studying the shadows which have been cast", as dealt with in the text on pages 82 to 85.
- one player is chosen to be "it" and is blindfolded
- you and the other children stand in a line and chant the following:
  - Our shadows are in front
  - Our shadows are behind
  - In front, behind
  - In front, behind.
  - Guess where they are now!
- everyone changes directions as indicated in the verse and upon saying "Guess where they are now!", all face in the same direction as you are facing
- "it" must then guess whether the shadows are in front of or behind the children
- after guessing, "it" chooses the next person to be blindfolded

### Silhouettes

- by making head or body silhouettes many concepts in this unit will be reinforced
- have the children work in pairs, with one child tracing the silhouette made on a sheet of paper when another child stands between the paper and a light source. (The children will have to experiment to find out where to stand in order to get a clear silhouette.)
- the traced silhouettes would be cut out, mounted on dark sheets of paper, and displayed in the science centre or in a hallway
- if names are not placed on the silhouettes, the children will have fun guessing which child each silhouette represents

# ORANGE BOOK (1)

## Unit 5: Time

Pages 96-119

### UNIT OVERVIEW

#### Concept Development

Understanding time is much more than being able to tell time. The development of time concepts begins very early in a child's life. Many of the early notions of time are based on the child's subjective understanding of the terms used. An "old person" to a six year old could have a different meaning to that of a forty year old person. In addition, many of the references that children hear refer to a flow of time, rather than given lengths of time. Some of the references are: time to get up; not now, but maybe later; just a second; hurry up; bedtime, etc...

The purpose of this unit is to help clarify and expand children's concept of time. The activities make use of routines, events, and experiences that are part of the life of children, in order to develop skills for measuring and recording time, and recognizing time units such as days, weeks, months, and years. The concepts of this unit are developed in a series of nine lessons.

The concept of a day is presented in the first two lessons, "A day" (pages 98-99), and "Daytime and nighttime" (pages 100-101).

"Telling the time of day" (pages 102-103) and "Minutes" (pages 104-105) are the third and fourth lessons, respectively. The concept that time can be progressively measured is developed, and the children are given activities to practise telling time.

The fifth through eighth lesson are designed to help the students understand the concept of longer periods of time. These lessons are "Yesterday, today, and tomorrow" (pages 106-107), "A week" (pages 108-109), "A month" (pages 110-111), and "A year" (pages 112-113).

The concept of time as an element in understanding and measuring the seasons is presented in the ninth lesson, "The seasons" (pages 114-117).

#### Process Development

Many of the "Finding Outs" in this unit are designed to help children recognize and clarify their understanding of a unit of time with the actual meaning or measurement of that unit of time. The skill used to achieve this is *comparing*—recognizing ways in which objects or events are alike or are different.

Students also *observe* some timing devices, use

these devices to *measure* units of time and *communicate* their observations orally, on charts or by using pictures.

#### Related Units

Light and Shadows *Orange Book (1)*

Measuring *Gold Book (2)*

The Moon *Gold Book (2)*

Watching the Sky *Brown Book (4)*

Energy: For Work and Motion *Exploring Matter and Energy (7)*

#### Materials and Advance Planning

Paper, crayons, large tin can, nail, hammer, minute timer, ruler, scissors

### TEACHING STRATEGIES

The purpose of the following activities and teaching strategies is to provide you, the teacher, with a wide variety of suggestions that can be used, together with the material presented in the textbook, to help guide your pupils in developing the processes and concepts of this unit.

#### Draw Five Things You Do Each Day

- Worksheet 1 reinforces the concepts on pages 98-101 of the text and provides a space for recording the pictures suggested in the "Finding Out" (p. 101)
- have strips of newsprint paper available so the children can complete their ordering and pasting of the pictures

#### Daytime and Nighttime

- this cut and paste activity extends the concept "Daytime and nighttime are parts of a day"
- each child must cut out the articles on the bottom of Worksheet 2 and paste them on the nighttime and daytime scenes
- this requires the child to compare and classify the pictures correctly

#### A Year

- Worksheet 5 is an extension of the concepts "The time in a year is divided into months" (p. 110-111) and "Some things happen at a certain time each year" (p. 112-113)
- by decoding, and following the directions given,



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each child will be able to complete the worksheet

### The Clock Struck (Time, Worksheet 4)

- lead a group discussion about types and functions of clocks, and about the hours during the day which are significant to the children
- have children think about one time of the day that has a special meaning to them, fill in that time on the clock, and print the story
- children who are not yet able to print their own stories could draw a picture and dictate their story for you to print
- the completed clock shapes can be cut out for display purposes

### Digital Clock

- there are many ways of making clock faces such as a paper plate clock that has two hands attached with a paper fastener
- because digital clocks are common now, the children might enjoy making the digital clock provided on Worksheet 3
  - duplicate the clock pieces onto construction paper or very lightweight cardboard
  - after the pieces are cut out, fit each strip through its designated slot and glue each strip to

form a circle

- the strips can then be moved freely, enabling the children to practise with their digital clocks
- besides being fun to work with, digital clocks reinforce the concept that there are sixty minutes in each hour and the children's ability to read the numbers one through fifty-nine

### Yesterday, Today, Tomorrow

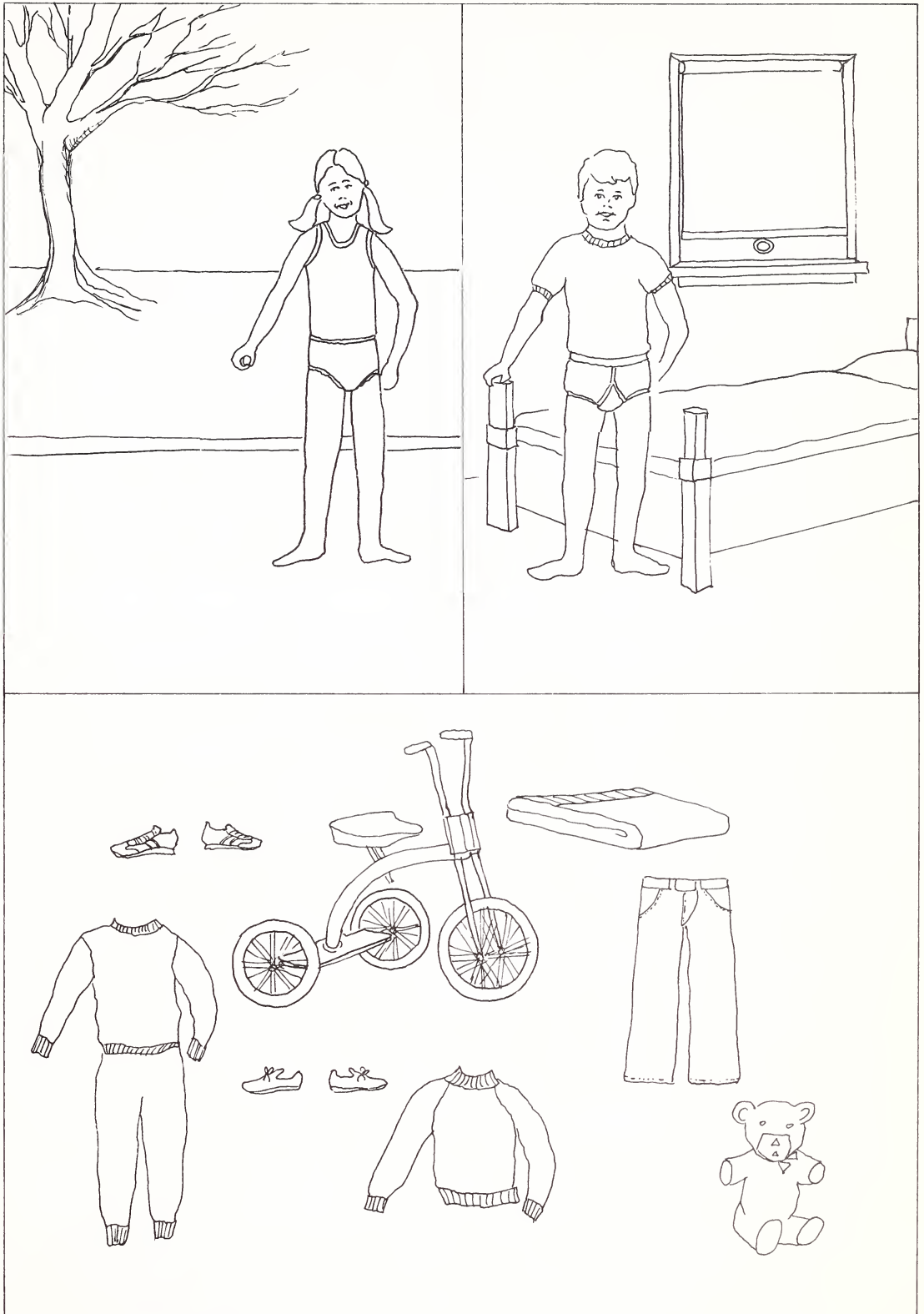
- although many children can recite the days of the week they do not all really understand the concept that one day precedes or follows another
- this action song, sung to the tune of Frère Jacques, will provide added practice
  - Yesterday was Sunday
  - Yesterday was Sunday,
  - Today is Monday
  - Today is Monday,
  - Tomorrow will be Tuesday
  - Tomorrow will be Tuesday,
  - Yesterday, today, tomorrow!
  - Yesterday, today, tomorrow!
- of course you will substitute the days of the week that are applicable to the day when you are singing the song

Draw 5 things you  
do each day. Cut  
them out. Paste  
them in order on  
a paper strip.

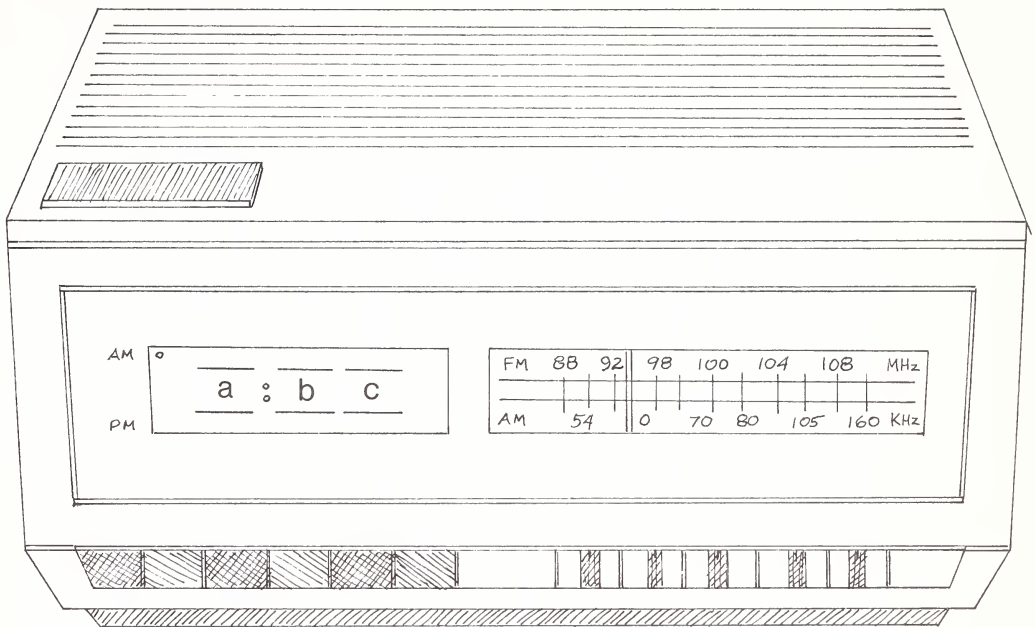








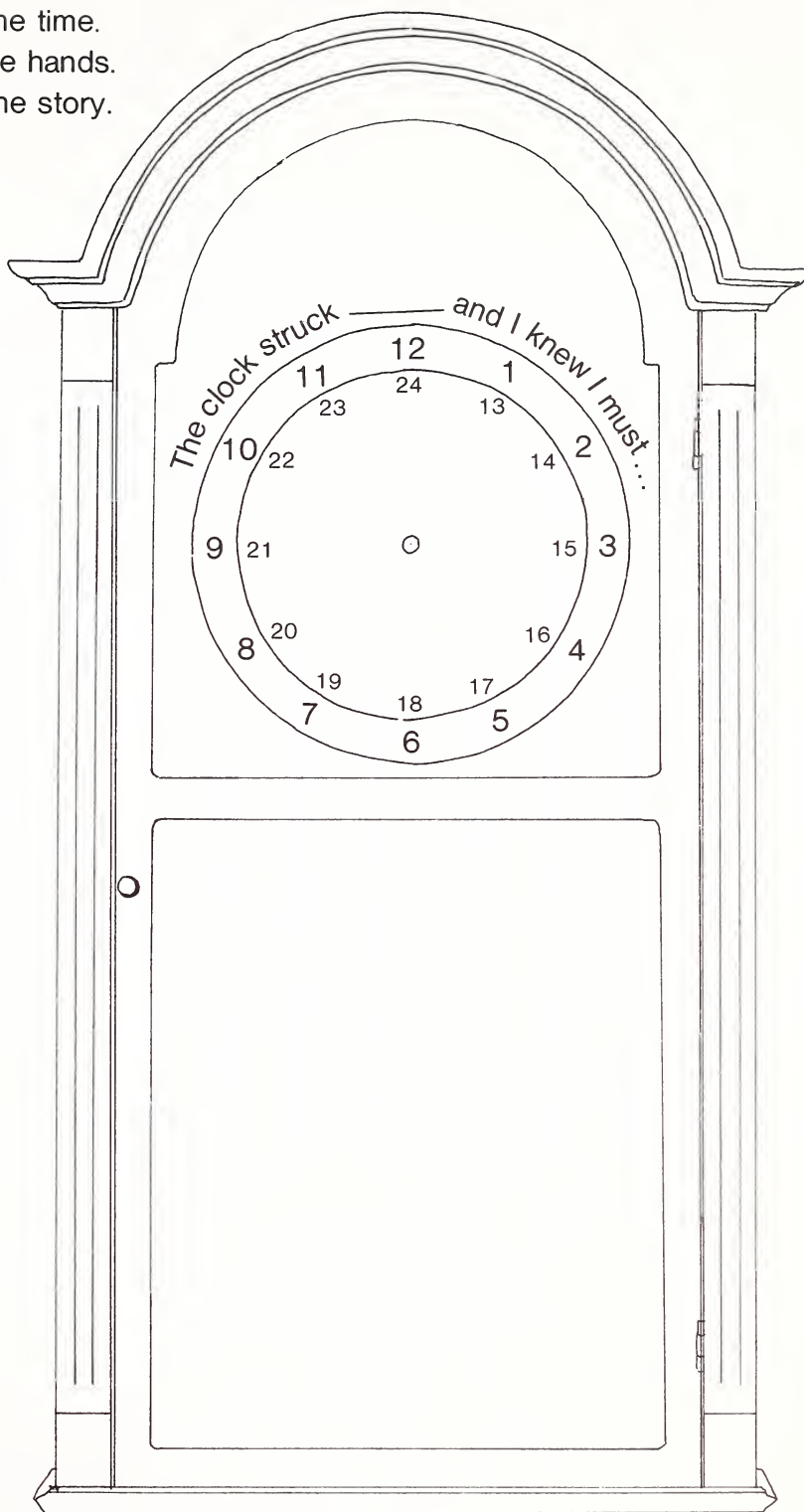




| a     | b     | c     |
|-------|-------|-------|
| 1     | 0     | 0     |
| 2     | 1     | 1     |
| 3     | 2     | 2     |
| 4     | 3     | 3     |
| 5     | 4     | 4     |
| 6     | 5     | 5     |
| 7     |       | 6     |
| 8     | Paste | 7     |
| 9     |       | 8     |
| 10    |       | 9     |
| 11    |       | Paste |
| 12    |       |       |
| Paste |       |       |



Put in the time.  
Draw the hands.  
Finish the story.







|         |          |       |       |     |      |      |        |           |         |          |          |
|---------|----------|-------|-------|-----|------|------|--------|-----------|---------|----------|----------|
| January | February | March | April | May | June | July | August | September | October | November | December |
|         |          |       |       |     |      |      |        |           |         |          |          |

Put a  on the month of Hallowe'en.

Put an X on the third month.

Underline the months with 8 letters.

Circle the months that begin with J.

Put a  on the Valentine month.

Draw two lines under the months that begin with A.

Put a  around the fifth month.

Draw a  on the month that comes after March.

Draw a  on the month of Christmas.

Put a  above the first month of school.

and a ... ..

There is ... ..

There is ... ..

There is ... ..

There is ... ..

There is ... ..

There is ... ..

There is ... ..

There is ... ..

There is ... ..

100

## ORANGE BOOK (1)

# Unit 6: Spaces and Places

Pages 120-141

### UNIT OVERVIEW

#### Concept Development

Early in their conceptual development, children have learned to delineate objects in their world by perceiving them through their senses and by giving them a form of spatial orientation. In this unit, children will have opportunities to sharpen their understandings of *direction and movement* in space. Being aware of, and having vocabulary to describe *spatial relationships* of, objects in the physical environment is necessary to many aspects of everyday life, and is an important skill in science.

Developing an understanding of spatial relationships requires an awareness of the concept that the position or movement of an object involves describing the object in relationship to a given property, or to other objects. In this unit, the students' descriptions of these relationships will be in relative terms. For example, they might describe the position of a tree by using the concept of "near" and "far." Being able to describe the spatial relationships of an object forms the basis for an understanding of *measurement*, which indicates the degree to which the object possesses a given property. For example, students might measure the position of the tree as being 100 m away from the fence. Units on measurement can be found in other levels of the program.

Children might find that developing an understanding of spatial relationships is somewhat difficult, mostly because spatial relationships are described relative to each individual. In these lessons, students use mainly visual cues to describe the position and movement of an object in space. To help them describe spatial relationships more accurately, you may wish to introduce the elements of perspective—that the position and movement of an object can be seen; nearer objects overlapping far objects; objects appearing large when close by and small when far away; objects appearing to be higher in the air close by and lower when further away, and using the sky, foreground and background in determining position and movement. You may also wish to introduce the concept of a frame of reference—that the position or movement of an object depends on the observer's position. For example, an object might be higher to a child and yet lower to an adult.

This unit develops the overall concepts: that spatial

relationships of objects involve describing them with respect to a given property; and that some words that can be used to describe position and movement of objects are: front, back, left, right, higher, lower, near and far.

These concepts are presented in a series of 5 lessons.

Lessons 1 to 4 develop the concepts of position, distance and height. Lesson 5 is a culminating activity, where students use all the concepts of the unit to describe the spatial relationships of objects.

#### Process Development

In this unit students observe, compare and describe the spatial relationships of objects, and they carry out a simple experiment to control the position and movement of a balloon in space. The main aim of the unit is to have students observe spatial relationships more carefully and to describe them more accurately.

#### Related Units

Light and Shadows *Orange Book (1)*

Measuring *Gold Book (2)*

Location, Motion and Force *Blue Book (3)*

Mapping the Earth *Green Book (5)*

The Earth in Space *Red Book (6)*

Science: Something People Do *Exploring Matter and Energy (7)*

Universe: Exploring Environment in Space *Exploring Earth and Space (7)*

#### Materials and Advance Planning

Paper, pencil, scissors, balloon.

### TEACHING STRATEGIES

The purpose of the following activities and teaching strategies is to provide you, the teacher, with a wide variety of suggestions that can be used, together with material presented in the textbook, to help guide your pupils in developing the processes and concepts of this unit.

#### Spaces and Places

- the concepts in this unit are very basic but are difficult for many children to master
- this is an area where repetition is essential in order for the children to develop a working understanding of these spatial relationships

- 
- included here is a variety of activities to aid you in helping the children develop a concrete understanding of Spaces and Places

### Matching Picture Cards

- these eight Matching Picture Cards can be used by individual students to increase their understanding of the terms in front, behind, left, right, higher, lower, near and far

### Location Cards

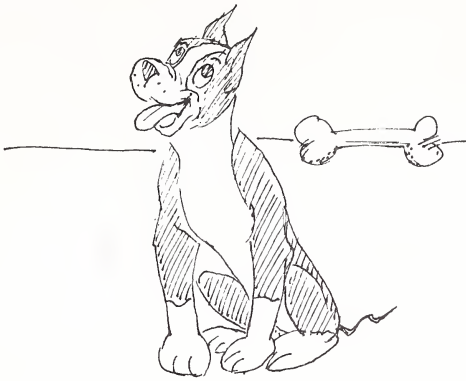
- working with a group of children, place the cards in a pile on the floor to designate a starting point for this game (If you wish, you can make a large X on the floor using masking tape)
- one child is chosen to begin; the student chooses one card and proceeds according to the directions
- when the destination is reached the child's position is described in relation to the surrounding objects. For example, "I am standing at the right side of the teacher's desk and in front of the waste paper basket".
- to increase the difficulty of this game, the children may be asked to choose two or more Location Cards and follow the directions
- depending on your surroundings and the abilities of your students, you may wish to make additional cards which would include more spatial terms and add specific physical movements

### Picture Placing

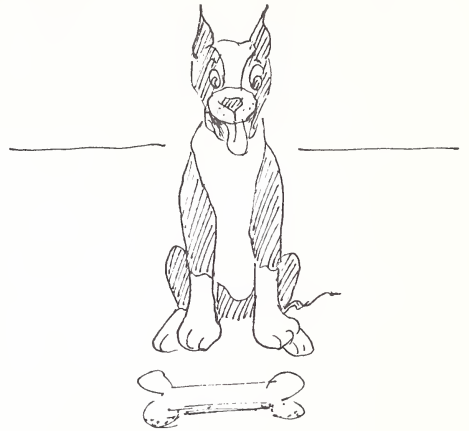
- after the children are familiar with the key words in this unit they will be able to complete "Spaces and Places, Worksheet 1" by following the phrases and pictures
- an alternative would be to carry out a similar activity where the children follow your instructions placing cut-out objects on a flannel board

### Movement and Space

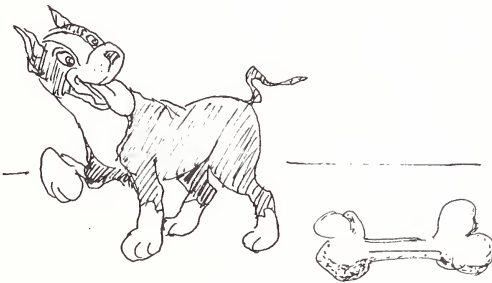
- carry your teaching of Spaces and Places to an outdoor area or gymnasium
- challenge your children to be aware of the relationships between their bodies and the spaces around them
- many physical movements can be incorporated with spatial terms.  
For example:
  - move using your right hand and your left foot
  - move keeping your elbows higher than your head
  - move with your head lower than your feet
  - hop on your right foot to the farthest fence or wall
  - crawl to someone near you
  - walk along a line placing one foot in front of the other
  - move holding your right foot behind you
  - move keeping your body as low as possible
- after experiences following specific directions, the children can be encouraged to explore spaces through body movements
- all types of equipment can be used to set up areas or mazes which will allow the children freedom to devise ways of moving in and filling spaces
- the children will undoubtedly think of ways to move:
  - through hoops, benches, tires, ladder rungs, chair legs, cardboard or cement cylinders
  - between skittles, bean bags, benches, chairs, skipping ropes
  - along benches, skipping ropes, horizontal ladders, lines on the floor, mats
  - over hoops, skipping ropes, vaulting boxes, mats, benches, skittles, a partner
  - with balls, balloons, bean bags, skipping ropes, hoops, a partner



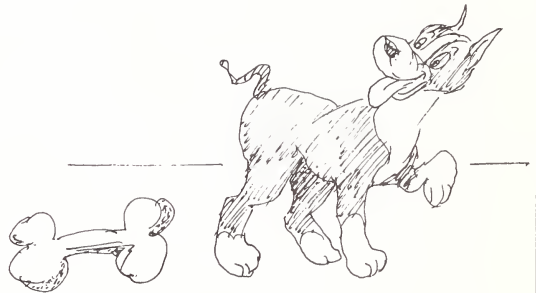
in front



behind



left

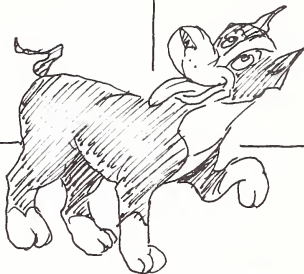


right





higher



lower



near



far



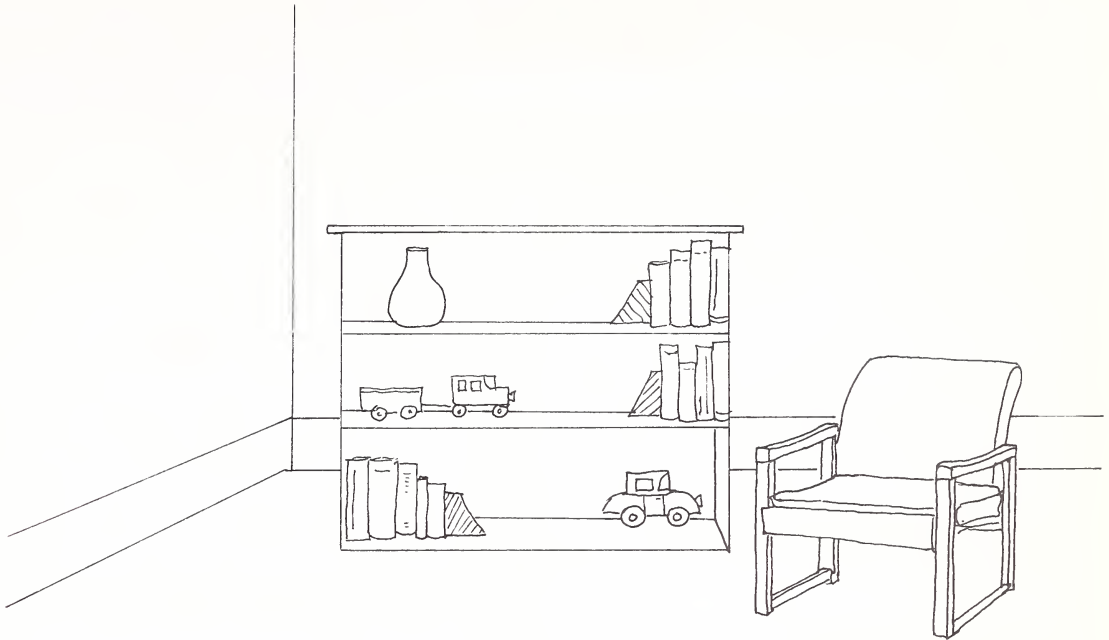



|  |  |                            |
|--|--|----------------------------|
| Turn to your left. Take 5 steps.                             | Turn to your right. Take 3 steps.        | Take 6 steps to the left.  |
| Take 2 steps to the right.                                   | Walk to the nearest wall.                | Go to the farthest window. |
| Putting one foot behind the other, take 4 steps to the rear. | Move to the front of the teacher's desk. | Go to the nearest chair.   |
| Stand near to a boy.   | Stand behind a friend.                   | Take 1 step to the left.   |



|                                   |   |  |
|-----------------------------------|---|--|
| Turn to your right. Take 7 steps. | Stand in front of a door.                         | Stand in front of the pencil sharpener.            |
| Move to behind your desk.         | Go to the farthest table.                         | Stand beside the farthest easel.                   |
| Touch the highest bookshelf.      | Touch the lowest tackboard.                       | Sit on the highest chair.                          |
| Stand near the highest picture.   | Take 1 step to the front and 3 steps to the left. | Take 2 steps to the right and 2 steps to the rear. |

|  |   |                                 |
|--|---|---------------------------------|
| Stand at front of the pencil sharpener           | Stand at front of a desk                          | Stand at front of table Y       |
| Stand behind the keyboard                        | Go to the leftmost edge                           | Stand behind your desk          |
| Sit on the rightmost chair                       | Sit on the lowest keyboard                        | Stand behind keyboard           |
| Take 2 steps to the right and 1 step to the rear | Take 4 steps to the front and 2 steps to the left | Stand near the rightmost corner |



1. Put a  behind the 

2. Put a  on the lowest 

3. Put a  near the 

4. Put a  on the highest 

5. Put a  to the right of the 

6. Put a  to the left of the 

7. Put a  in front of the 



1. Put a...
2. Put a...
3. Put a...
4. Put a...
5. Put a...
6. Put a...
7. Put a...



## GOLD BOOK (2)

# Unit 1: Food for Animals and You

Pages 6-31

### UNIT OVERVIEW

#### Concept Development

In the preceding level of the program, the following concepts were introduced and developed:

There are many kinds of living things. The two broad groups of living things are animals and plants. Some of the characteristics of animals are that they grow and change, move by themselves, reproduce and care for their young. Animals need food, air, water and proper temperatures in order to live and grow.

The concepts of this unit are developed in a series of nine lessons:

In lesson one, "Animals need food," students are introduced to the concept that animals are consumers. Animals must consume food because they are not able to produce their own food in their bodies as, for example, green plants do. The green plants are the producers of food. They utilize water, minerals from the soil, carbon dioxide and energy from the sun to make carbohydrates, and some proteins and fats. Animals obtain the energy they need for carrying out their life functions from the chemical energy stored in food.

Lesson two, "Food from plants," introduces the concept that some animals are primary consumers. These animals feed directly on the food makers, the plants, and hence are called primary consumers. Animals that feed on plants are also called herbivores.

In lesson three, "Food from other animals," the concept of secondary consumers is introduced. These animals eat other animals to obtain food. Animals that feed on other animals are called carnivores or predators. They utilize the stored chemical energy in the cells of their prey for their food needs.

The concept of "Food chains" is presented in the fourth lesson. A food chain is a way of depicting a food relationship that might occur, and the chain of dependency that exists among living things in any kind of environment. A food chain is a way of passing energy from one kind of living thing to another. It begins with the producers, is passed on to the primary consumers, (herbivores), it continues on to the secondary consumers (carnivores), and scavengers and decomposers then return dead animals and plants and other wastes to the soil as nutrients.

The fifth lesson, "Helping animals get food," introduces the concept that people play an important role in maintaining a balance in food relationships. People

provide food, or the means of obtaining food, to those animals that they raise as pets or for livestock. These same animals could forage for themselves in the wild, but restricting their ability to hunt for food makes them animals dependent on their owners for nourishment.

Lesson six to eight, provide an opportunity for students to examine their own eating habits. The concept that proper nutrition and choice of foods will better enable them to carry out their daily life functions is developed.

The ninth lesson, "People and food chains," develops the concept of interdependency. People, too, are a part of food chains, and are dependent on plants and animals for their food.

#### Process Development

In this unit students *observe* a variety of food relationships; they *collect data* from pictures, or by observing animals eating, on food sources for animals and people; they *interpret* the data, making *inferences* from their data and observations; and they *classify* the food relationships that they *investigate*.

*Interpreting data* is a process that is basic to science, and vital to many other disciplines and experiences in and out of school. People are constantly interpreting data, when they are in conversation, when they read maps, magazines or newspapers or when they watch T.V. Data interpretation is based on observations, measurements, classifications and other information, and the interpretation leads to inferences, predictions and hypotheses. In this unit students interpret mainly pictorial data and data collected by animal observation. They make inferences and classification systems from their interpretations.

*Classification* is a grouping process designed to give order to collections of objects or events. Classification schemes can be used to identify objects or events, or to demonstrate similarities, differences and interrelationships in a collection of objects or events. The grouping is based on observable characteristics and divides the collection into subsets which are more homogeneous than the collection. When a classification results in two subsets, it is called a single-stage classification system. If the first stage requires further sorting, the result is a multi-stage classification system. In this unit, students carry out mainly single-stage classifications.

## Related Units

Living Things *Orange Book (1)*  
Environment *Gold Book (2)*  
Animal Behaviour *Blue Book (3)*  
Animals and Their Environment *Brown Book (4)*  
Your Body *Green Book (5)*  
Ecosystem Earth *Red Book (6)*  
Ecology: Interaction in The Environment *Exploring Living Things (7)*  
Biology: The Study of Living Things *Exploring Living Things (7)*

## Materials and Advance Planning

Old magazines, scissors, paper, pencil, crayons.

You may wish to have your students observe the food relationships of some animals in the classroom. Select your animals and establish them in the classroom before you begin this unit. Involve students in the proper care and maintenance of the animals and their shelters.

You may also wish to investigate the school ground and neighbourhood before you begin this unit, to see if there are any examples of food relationships that you can use with your students for this unit.

## TEACHING STRATEGIES

The purpose of the following activities and teaching strategies is to provide you, the teacher, with a wide variety of suggestions that can be used, together with the material presented in the textbook, to help you guide your pupils in developing the processes and concepts of this unit.

### Food From Plants

- Picture Cards 1 accompany the concept "some animals need food from plants" (pages 10 to 13 of the text)
- the children may match the animal with the plant it eats. Since some animals eat a variety of plants, there is more than one possibility for matching the cards
- the Picture Cards could also be used to encourage the children to write short stories about the various animals
- the children could be required to select a picture card and research information about the animal chosen

### Food From Other Animals

- Picture Cards 2 are a set of matching cards to accompany the concept "some animals need food from other animals" found on pages 14 and 15 of the text
- this set of cards may be used in the same ways as Picture Cards 1

## Animals Eat

- Worksheet 1 is an extension of the concepts found on pages 10 to 15 of the text
- the children can draw and label their own pictures or they can sort the cards from Picture Cards 1 and 2 into categories

## Helping Animals Get Their Food

- Worksheets 2 and 3 are related to pages 18 and 19 of the text
- Worksheet 2 entitled "Feeding My Pet", is intended for story writing. It can be duplicated on lined paper.
- Worksheet 3 provides the children with spaces to draw five animals which need help getting their food. The food each animal eats and a short statement about each could be included.

## Food For People

- several activities extend the concept and the suggestions found on pages 20 and 21
- after cutting out many pictures of foods, the children can sort these into the five food groups according to colour, according to packaging, into liquid and solid foods, into foods eaten at breakfast, lunch and dinner, and into types of snacks. The sorted pictures can then be glued onto paper plates that have been labelled appropriately
- after some sorting experiences and discussion about the five food groups, the children will be able to complete Worksheet 4 by drawing foods from these groups. As an alternative, pictures may be glued onto the worksheet in the balloons.
- Worksheet 5 provides the children with a place to write about and draw their favourite food

## Food From Plants

- Worksheets 6 and 7 complement the "Finding Outs" on pages 26 and 27 of the text
- the children will be able to use these worksheets for:
  - recording the information learned from following the suggestions on these pages
  - recording research about one specific plant or animal
  - listing specific foods and the ways in which each can be obtained. For example, potatoes are available from the garden, fresh in the store, canned, dehydrated or frozen.

## Food Chains

- the concepts that people and animals are part of food chains needs extra reinforcement to be fully understood
- much discussion and the completion of Worksheet 8 should aid in clarifying these concepts



seeds



berries



grass



nuts

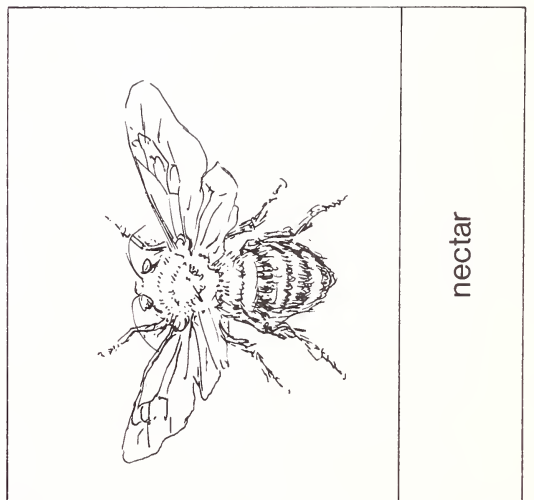
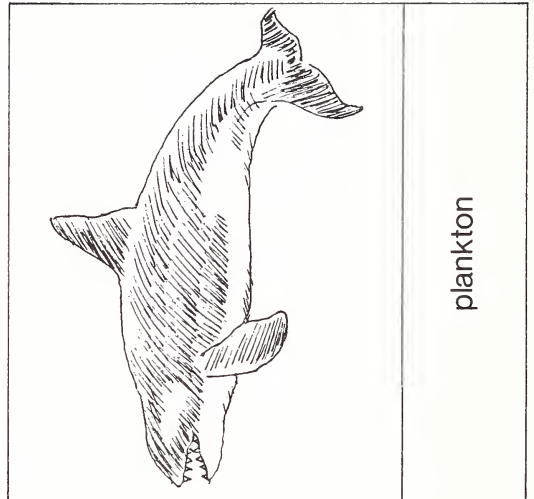
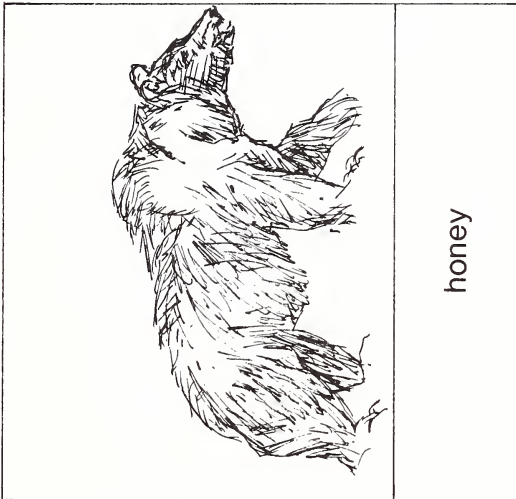
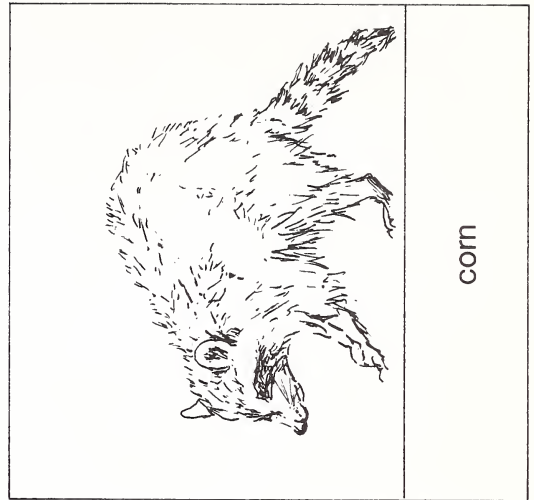
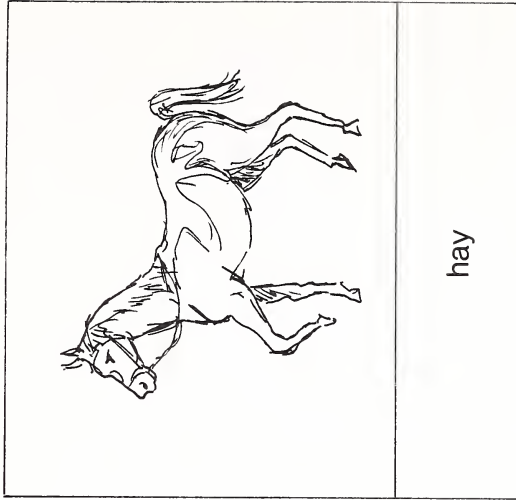


lettuce



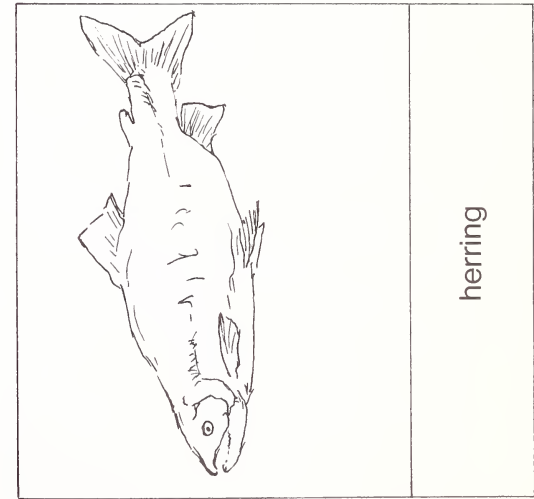
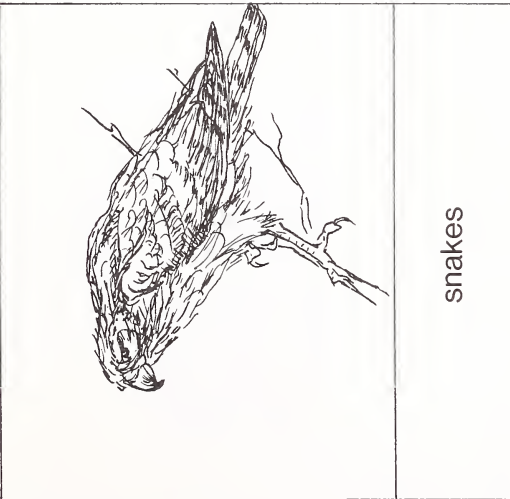
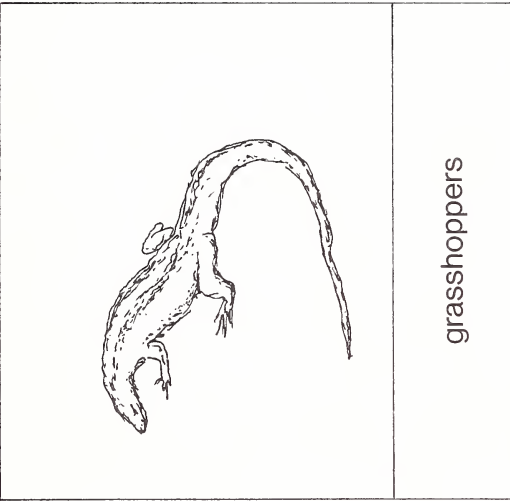
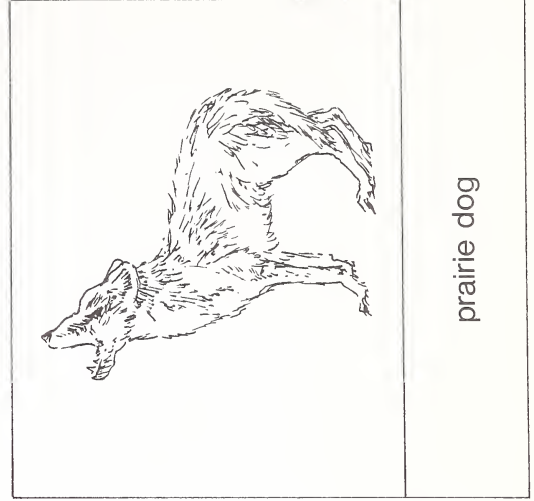
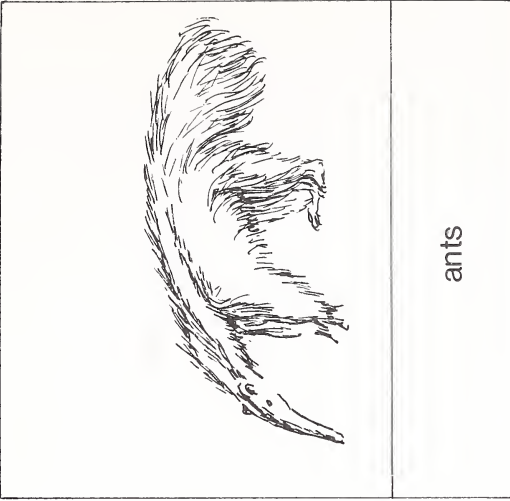
grain





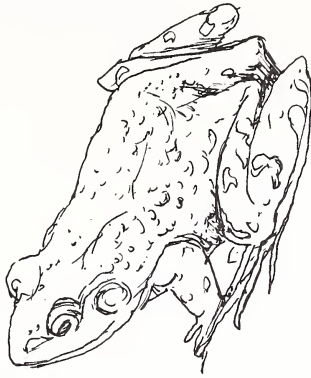




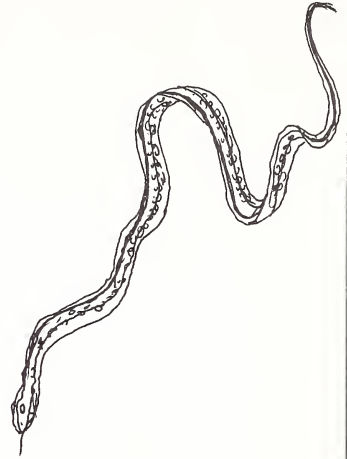








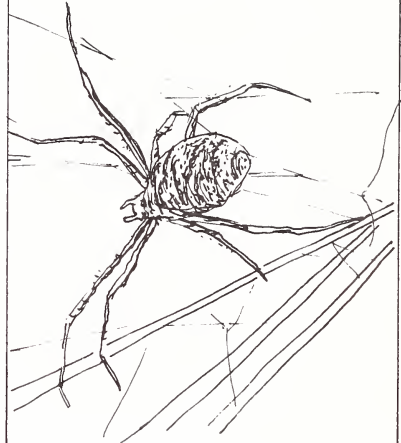
spiders



field mice



chickens



insects



fish



worms



Animals

Animals

Plants and

Plants

Animals Eat...

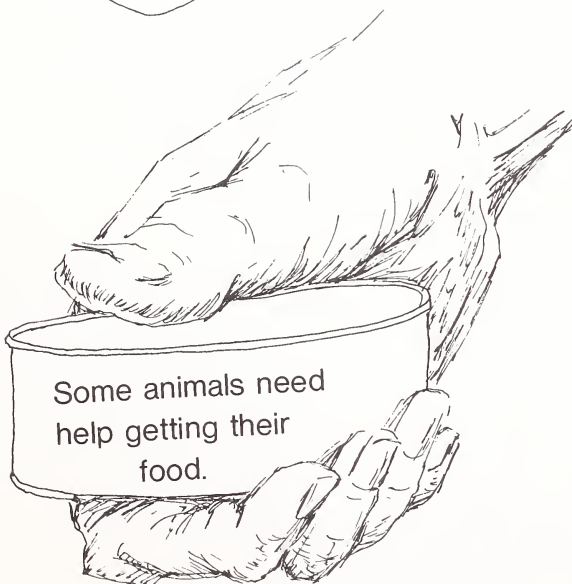




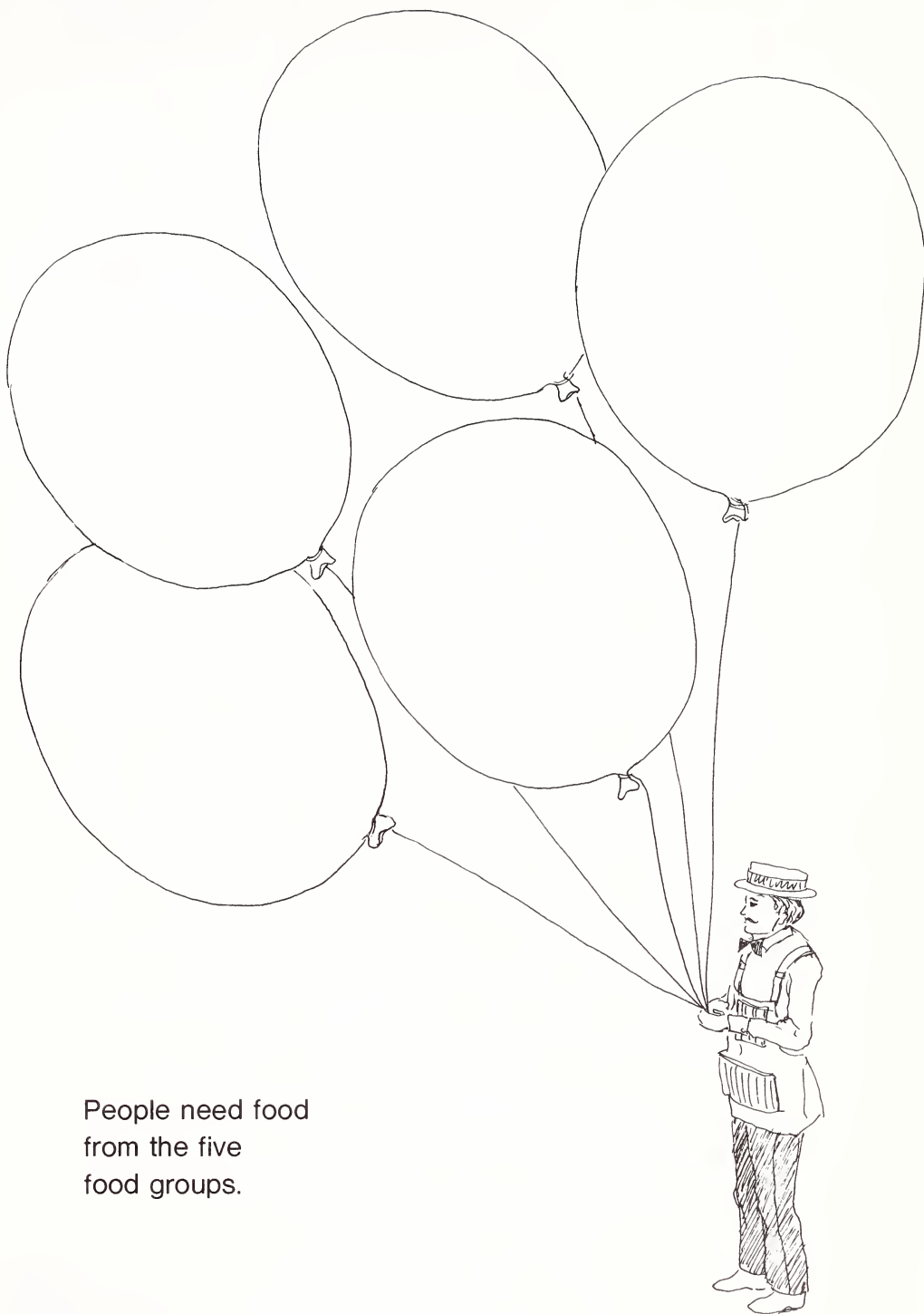
Feeding my pet











People need food  
from the five  
food groups.





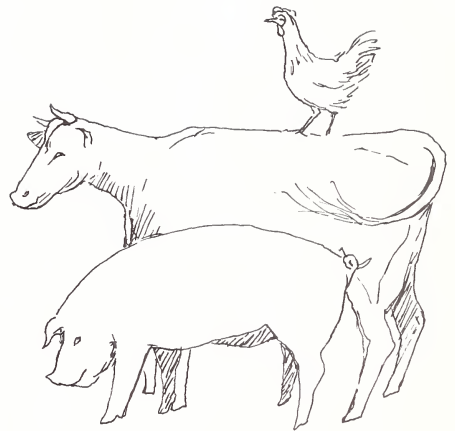




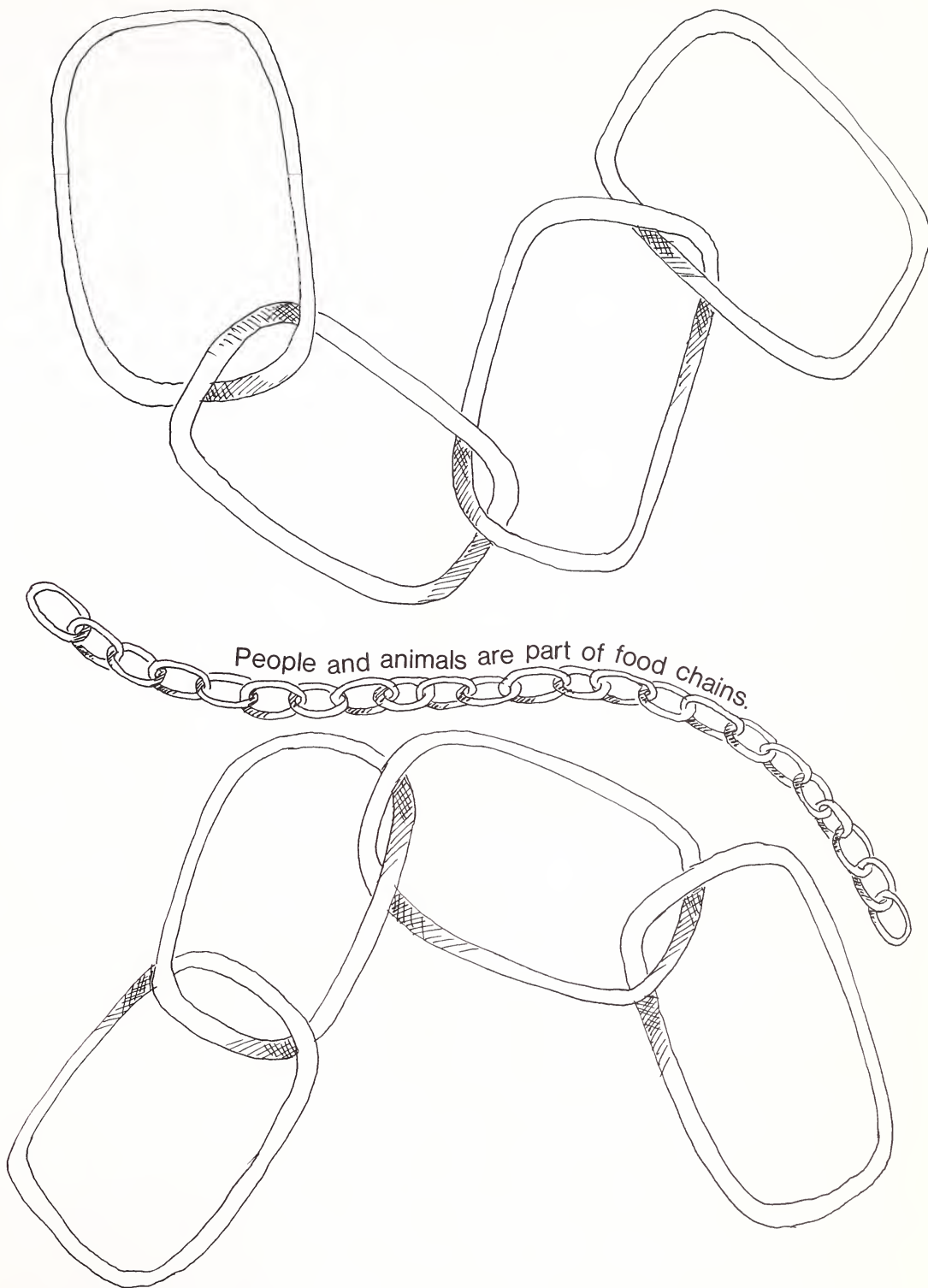
Food from plants



the [unclear] [unclear] [unclear]









## GOLD BOOK (2)

# Unit 2: Environment

Pages 32-63

### UNIT OVERVIEW

#### Concept Development

In the *preceding* level of the program, the following concepts were introduced and developed:

Objects and events in the environment can be perceived and described by using one or more of our senses. There are living and non-living things in the environment. Living things have certain characteristics and needs. They have structures that enable them to meet their needs in the environment.

In this unit, students are introduced to the concept of “*environment*.” They learn that everything around them contributes to their environment. The concept that living things and the environment are continually *interacting* and *changing* is also developed. As they progress through the unit they will begin to understand the delicate *balance* that exists in the environment and the important role that each living thing plays in *maintaining* and *protecting* that balance. These concepts are developed in a series of ten lessons.

In the first lesson, “Your environment” (pages 34-35), students learn what is meant by an environment. Being egocentric, young children at first view their world only in terms of how it affects them. As they develop, they look more closely at their environment and they begin to examine the people-made world within the natural world. Their concept of environment now changes focus from themselves, to realizing that things in the environment are interdependent. The concept that people live in a variety of environments and can be healthy and happy in them is also developed in this lesson.

Lesson two, “Places in your environment” (pages 36-37), considers places that make up part of the students’ physical environment—places where they live, play, eat and learn. The third lesson, “People in your environment” (pages 38-41), then develops the concept of dependency among people in an environment. People serve as companions, guides, teachers, protectors and providers of services. This is followed, in the fourth lesson, “Animals and plants in your environment” (pages 42-45), by students considering their relationship with plants and animals in their environment.

The fifth lesson, “Sound and light in your environment” (pages 46-49), develops the concept that sound and light help us sense a great deal about the

environment, and that light and sound have many uses in the world. In lesson six, “Air, water, and food in your environment” (pages 50-51), students are made aware that all living things are dependent on air, water and food for survival. This is followed in the seventh lesson, “Weather in your environment” (pages 52-53), by introducing students to the concept that moving air, precipitation and temperature all contribute to the weather of a particular place.

In the eighth lesson, “Changes in your environment” (pages 54-55), the concept that things are continually changing is developed. Students look at changes occurring in their environment. They become aware that some changes are good changes and some changes are bad changes, and they realize that they are in part responsible for some of the changes that occur. The concept that we all have a responsibility to help maintain a clean and healthy environment can also be developed.

In the ninth lesson, “Plants and their environment” (pages 56-59), and the tenth lesson, “Animals and their environment” (pages 60-61), the concept that living things are adapted to their environment is introduced.

#### Process Development

In the “Finding Out” activities, students *observe* the places, people, living things, sounds and weather in their environment. They *interpret* their observations to make *comparisons* and *inferences*. They also carry out a systematic *experiment* to make an environment for plants, and they observe changes in their plants over a period of time. Throughout these activities, students *communicate* observations and interpretations in discussions, in writing, on charts, tables, sketch maps or using pictures.

A word about *observing*. Observing is the most basic process used in science. Questions, curiosity and topics for investigation about objects or events in the environment, are usually initiated by informal observations. Accurate and structured observations are the basis for any scientific investigation. These observations are used to make comparisons, inferences, predictions and hypotheses.

As students investigate their environment, have them determine the properties of objects and events by using several or all the senses. Also, try to develop

in children the ability to observe all around them—at different levels and in different directions.

### Related Units

Your Senses *Orange Book (1)*  
Living Things *Orange Book (1)*  
Food for Animals and You *Gold Book (2)*  
Animal Behaviour *Blue Book (3)*  
Animals and Their Environment *Brown Book (4)*  
Interacting with Your Environment *Red Book (6)*  
Ecosystem Earth *Red Book (6)*  
Ecology: Interaction in the Environment *Exploring Living Things (7)*  
The Earth: Its Nature and Importance to You *Exploring Earth and Space (7)*

### Materials and Advance Planning

The following list includes the materials that a student, or a group of students, will need to carry out the "Finding Out" activities. In some instances, other materials may be substituted for those on the list:

Paper, crayons, pencils, stick, watch, large poster-board, coloured paper, scissors, tape, ruler, glass or plastic terrarium with a clear top, plants, soil, sand.

You may wish to investigate the schoolground and the neighbourhood before beginning this unit to identify experiences or locations that could be used.

### TEACHING STRATEGIES

The purpose of the following activities and teaching strategies is to provide you, the teacher, with a wide variety of suggestions that can be used, together with the material presented in the textbook, to help guide your pupils in developing the processes and concepts of this unit.

#### Photo Studies

- photo studies would be an excellent way to develop all of the concepts in this unit
- you may wish to take the pictures and have the children sort, classify and label them for display
- or, more effectively, have the children decide on and take their own pictures
- with a few simple instructions, children can operate many of the inexpensive, easy-to-use cameras that are on the market
- if you have difficulty obtaining cameras, contact the audio-visual department of your local school board—they often have photographic equipment available on loan.

#### Look at Your Environment

- to reinforce the concept on page 34 of the text, "your environment is everything around you", have the children use Worksheet 1 to record their observations of the environment around them
- you may have the children look in a specified direction or instruct them to survey their entire

- environment and select notable details to record
- for your "prolific writers", an attached sheet of lined paper will provide sufficient writing space
- the completed worksheets can be cut out and displayed or made into a class booklet

#### Environment Tally Sheet

- a class walk around the immediate neighbourhood will be fun and will enhance the two concepts "your environment is everything around you" and "your environment includes many places".
- Worksheet 2 enables the children to count and record the number of specific objects they see on their outing
- with teacher aides or parents to assist, the class may be divided into small groups and sent off to walk in different areas. Comparisons can be made of their findings.

#### Where

- Worksheets 3, 4 and 5 are to accompany the "Finding Out" on page 37 of the text, and require the children to think about their daily environment and share it with others through illustrations
- these worksheet pages can be cut in half and stapled together to form a six page booklet for the children to complete
- when all the pages are complete the children can design a cover for their booklets

#### Land, Air, and Water

- the concepts on pages 42 to 45 of the text show that animals and plants are found on land, in the air, and in or on water
- children will find this interesting, and will enjoy completing Worksheet 6 with their own drawings or with pictures they have cut from magazines

#### Pets in Our Environment

- the animals that are most familiar to children are pets and Worksheet 7 deals specifically with those animals
- the open spaces on this worksheet will allow the children to draw and name their favourite pets
- this activity will lead to the making of graphs such as
  - Our Favourite Pets
  - Pets in Our Classroom
  - Pets We Have at Home
  - Pets With Four Legs
  - At the Pet Shop We Saw ...
  - Pets With Fur
  - Pets With Long Tails

#### What I Observed

- Worksheet 8 can be used in communicating the observations made in the "Finding Out" on page 44 of the text



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### Sounds All Around Me

- the children can use Worksheet 9 to record their observations about the sounds around them
- these worksheets can be cut out and displayed, made into booklets, or strung together on a long ribbon or piece of wool and hung in the music corner

### Light Up My Life

- Worksheet 10 will be useful for recording the children's awareness of light in their environment
- the children may draw or print about light sources or the ways light is helpful to them

### My Calendar

- the "Finding Out" on page 53 is accompanied by Worksheet 11
- each child completes this monthly calendar by filling in the date and the weather each day
- at the end of the month, a tally is made of the weather and the bar graph is completed
- if your class makes calendars for several months, interesting comparisons can be made

### Plants and Their Environment

- to accompany the suggested research activity on page 57 of the text, the children complete Worksheet 12 following the instructions given

### Animals and Their Environment

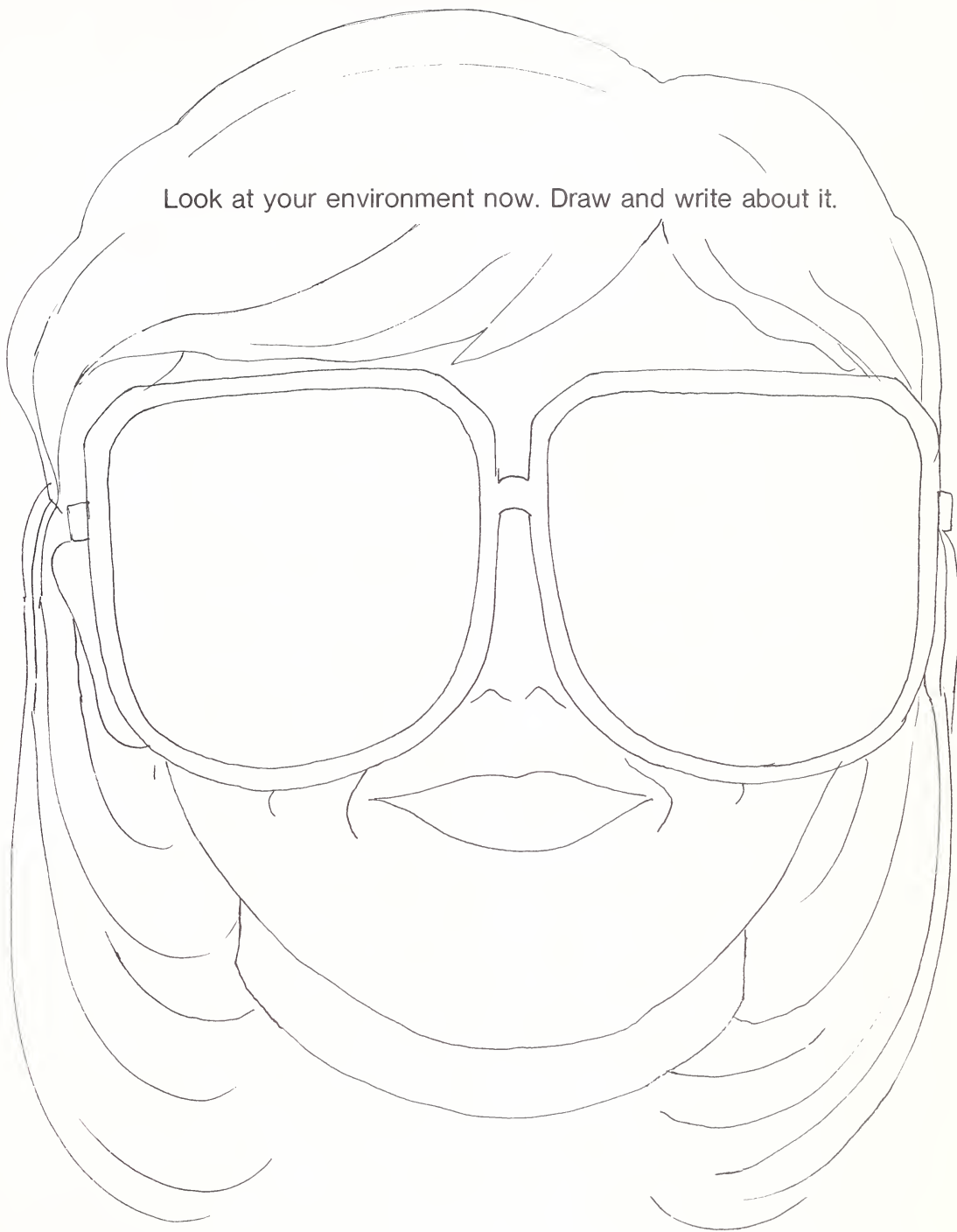
- Worksheet 13 provides the children with a place to record their findings from the research activity suggested on page 60 of the text

### Environment Scramble

- as a summary activity invite your students to have some fun making words using the letters in the word "environment"
- each letter can only be used the number of times it is actually found in the word. For example, "environment" only contains one "t", so any words the children make can only contain one "t"
- some words the children may make include: ten, on, in, it, to, toe, ton, tone, tenor, tine, tin, teen, tore, torn, tie, time, timer, term, tire, tree, trivet, trim, trio, me, men, met, metre, meet, mite, mint, mine, miner, miter, meteor, mentor, merit, more, motive, move, mention, iron, or, ore, over, oven, eon, eve, ever, enter, eve, entire, emit, eminent, never, no, not, note, net, norm, nerve, neon, into, ion, invent, roe, rove, rote, rot, rivet, rent, rite, riot, rim, remit, remote, remove, vet, vent, vine, veer, vie, vote, venom, vermin, vomit, vein
- the children may list their words on a large chart as a class project, or groups of children may compete to see who can make the most words



Look at your environment now. Draw and write about it.

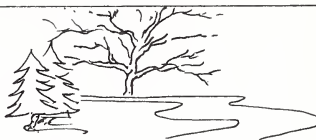




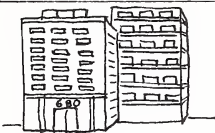
# Environmental Tally Sheet



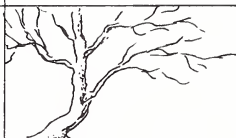
houses



parks



apartments



trees



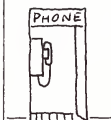
stores



fire hydrants



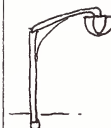
gas stations



public telephones



office buildings



street lights



traffic signs



fences



animals





Where I sleep



Where I play







Where I eat



Where I learn



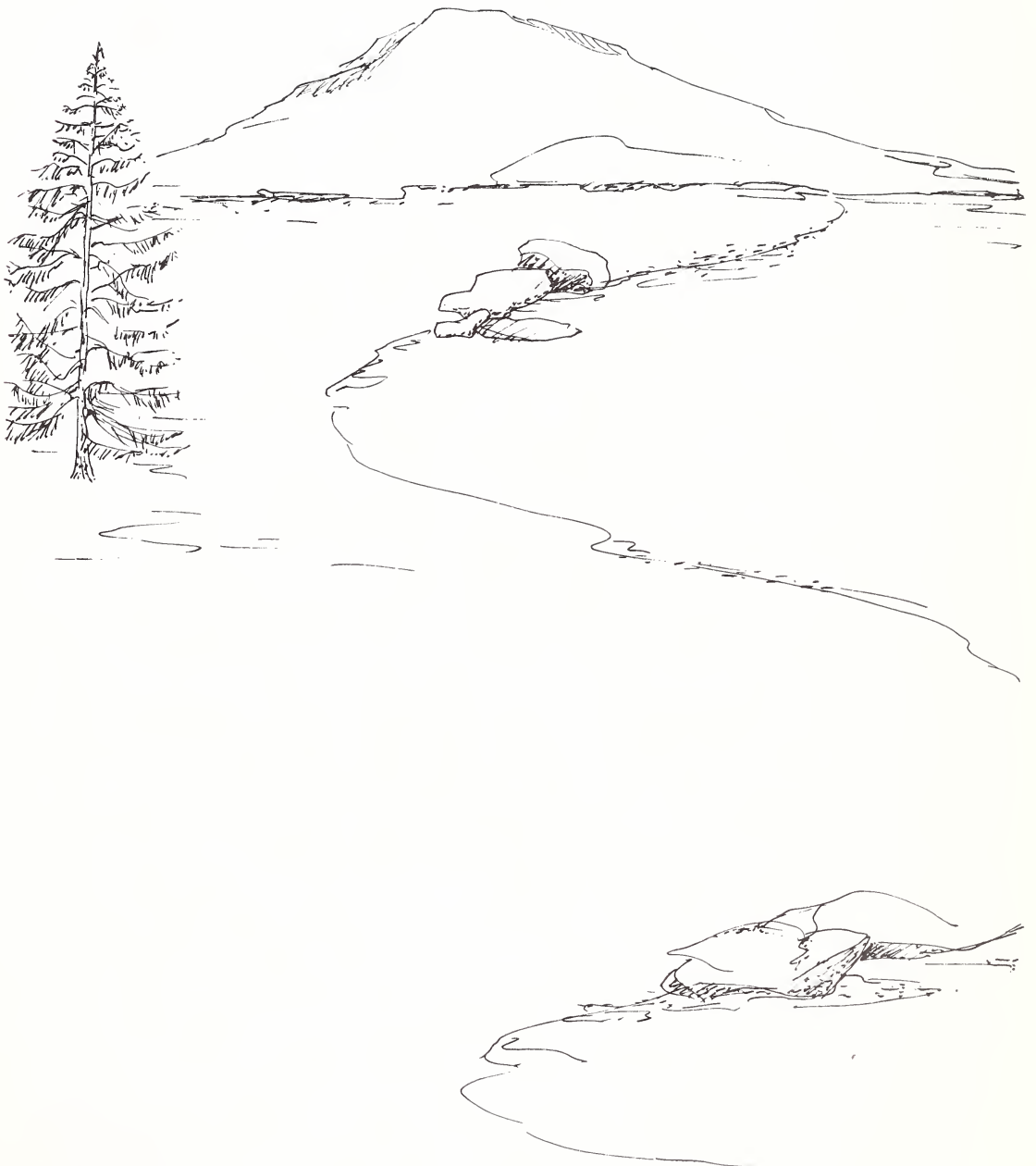


Where I shop

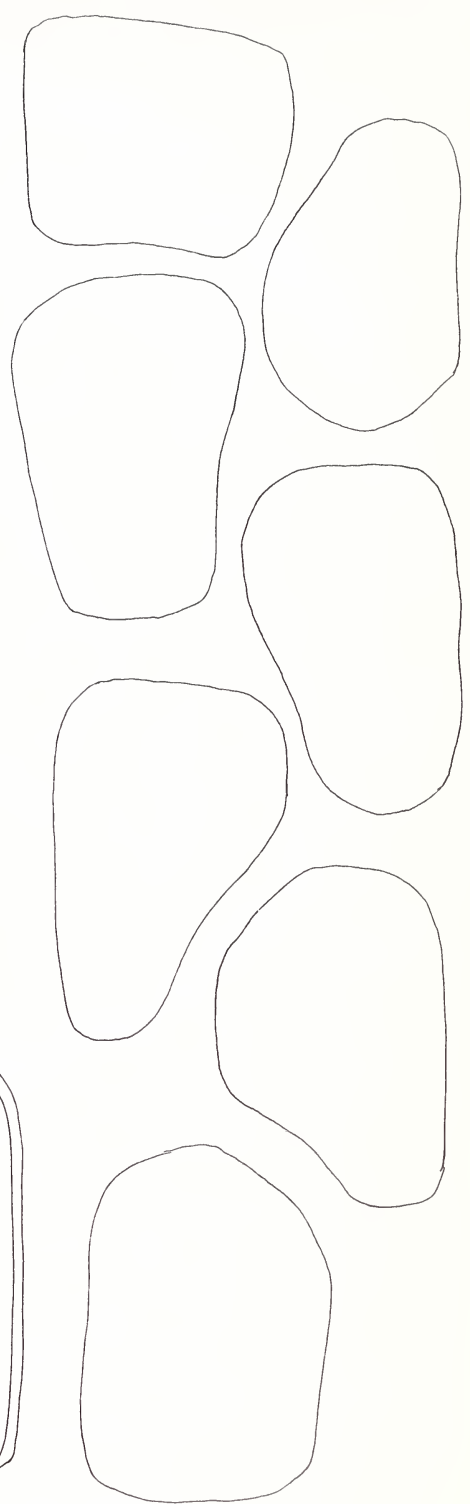
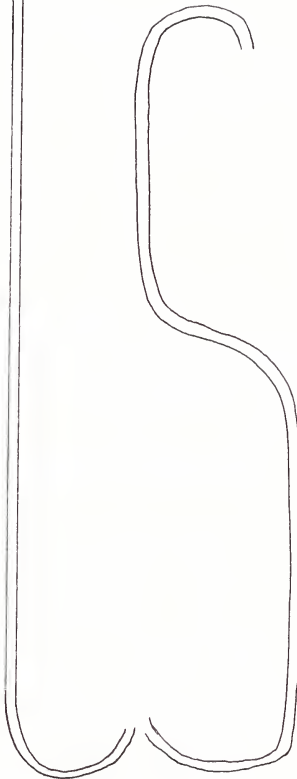
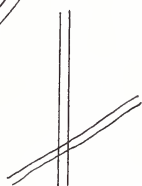
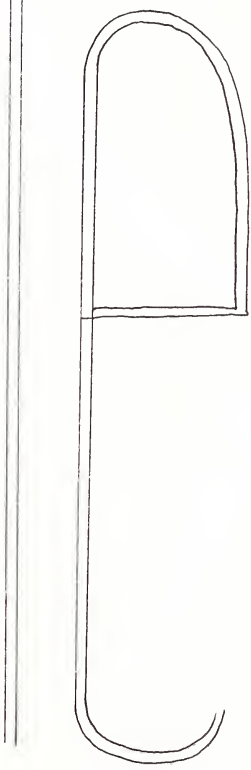
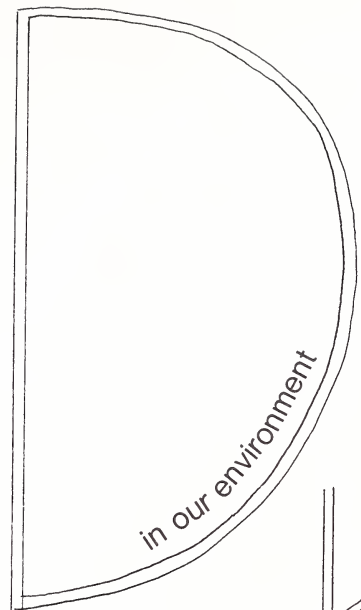


Where I like to go



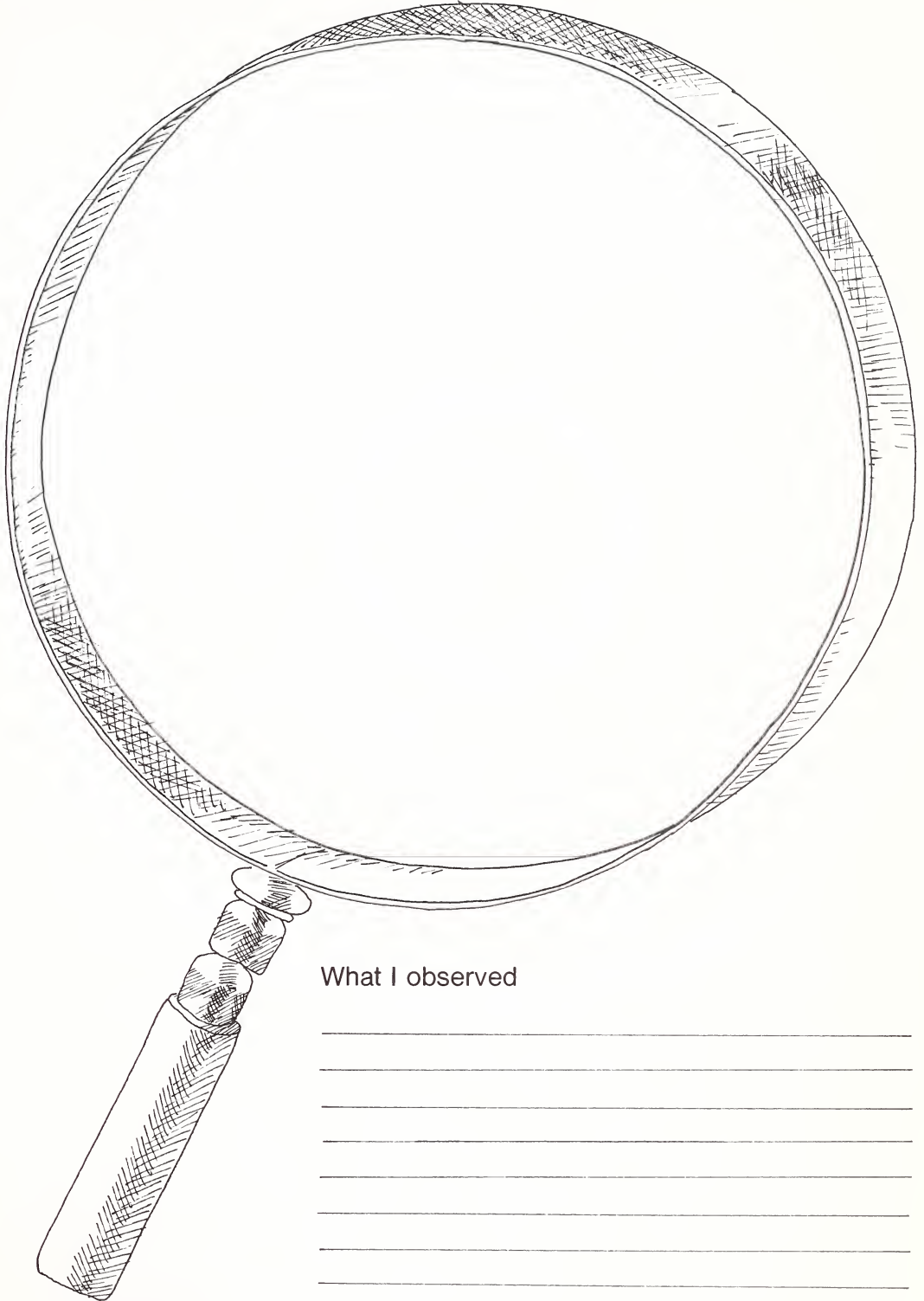












What I observed

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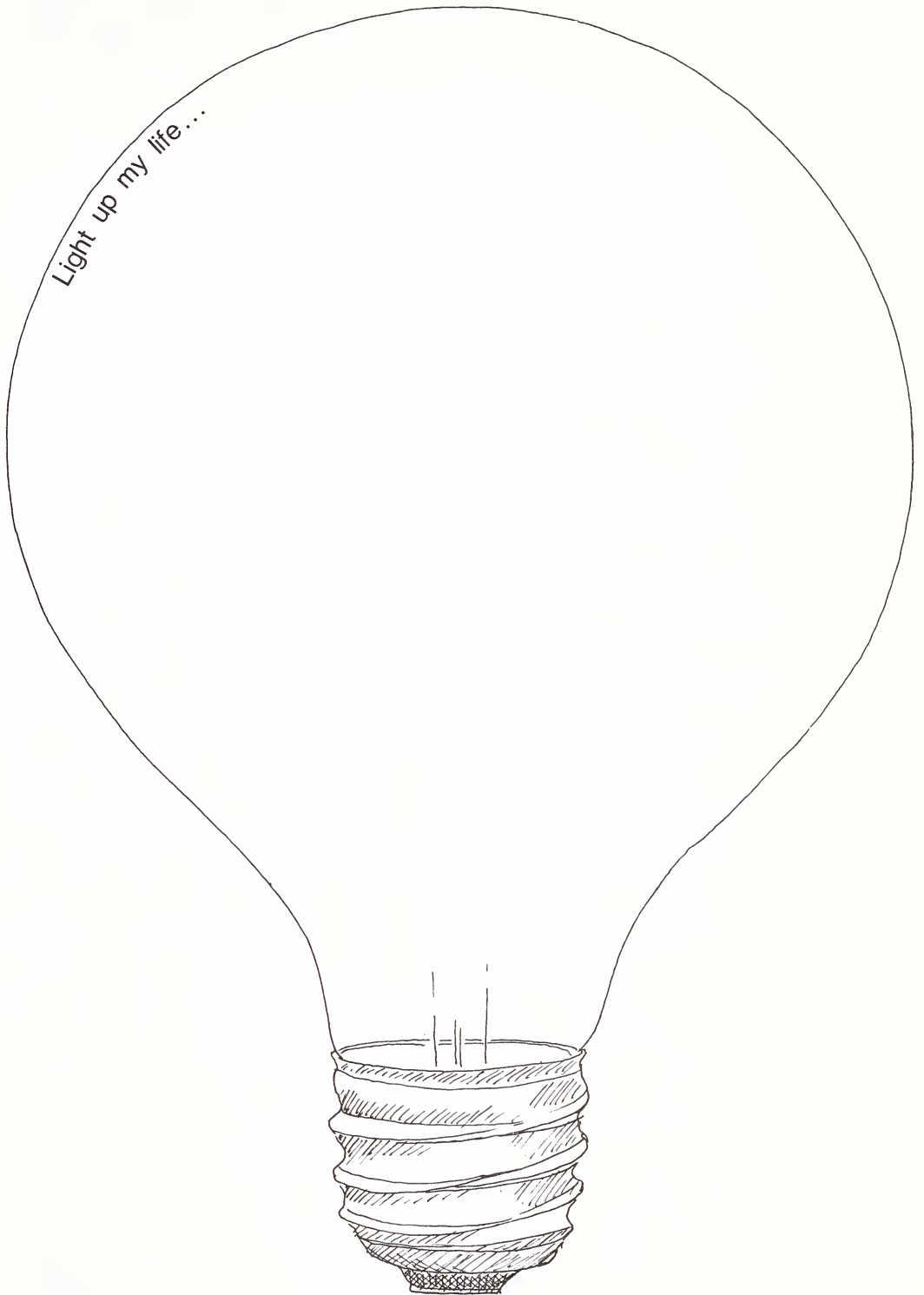
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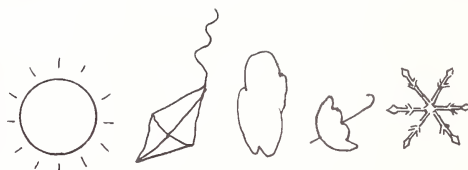




# My Calendar for \_\_\_\_\_

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|--------|--------|---------|-----------|----------|--------|----------|
|        |        |         |           |          |        |          |
|        |        |         |           |          |        |          |
|        |        |         |           |          |        |          |
|        |        |         |           |          |        |          |
|        |        |         |           |          |        |          |

Weather

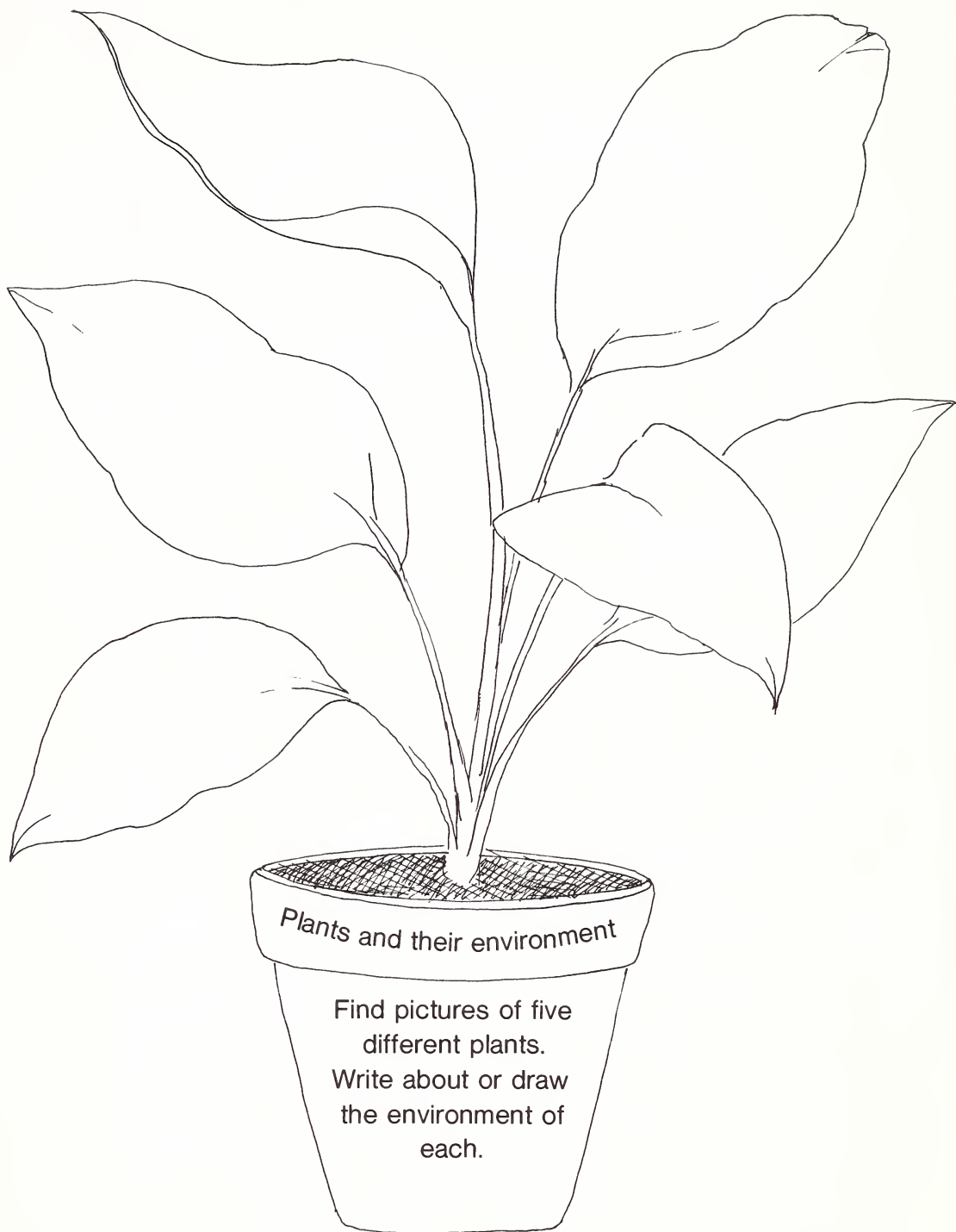


Number of Days

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

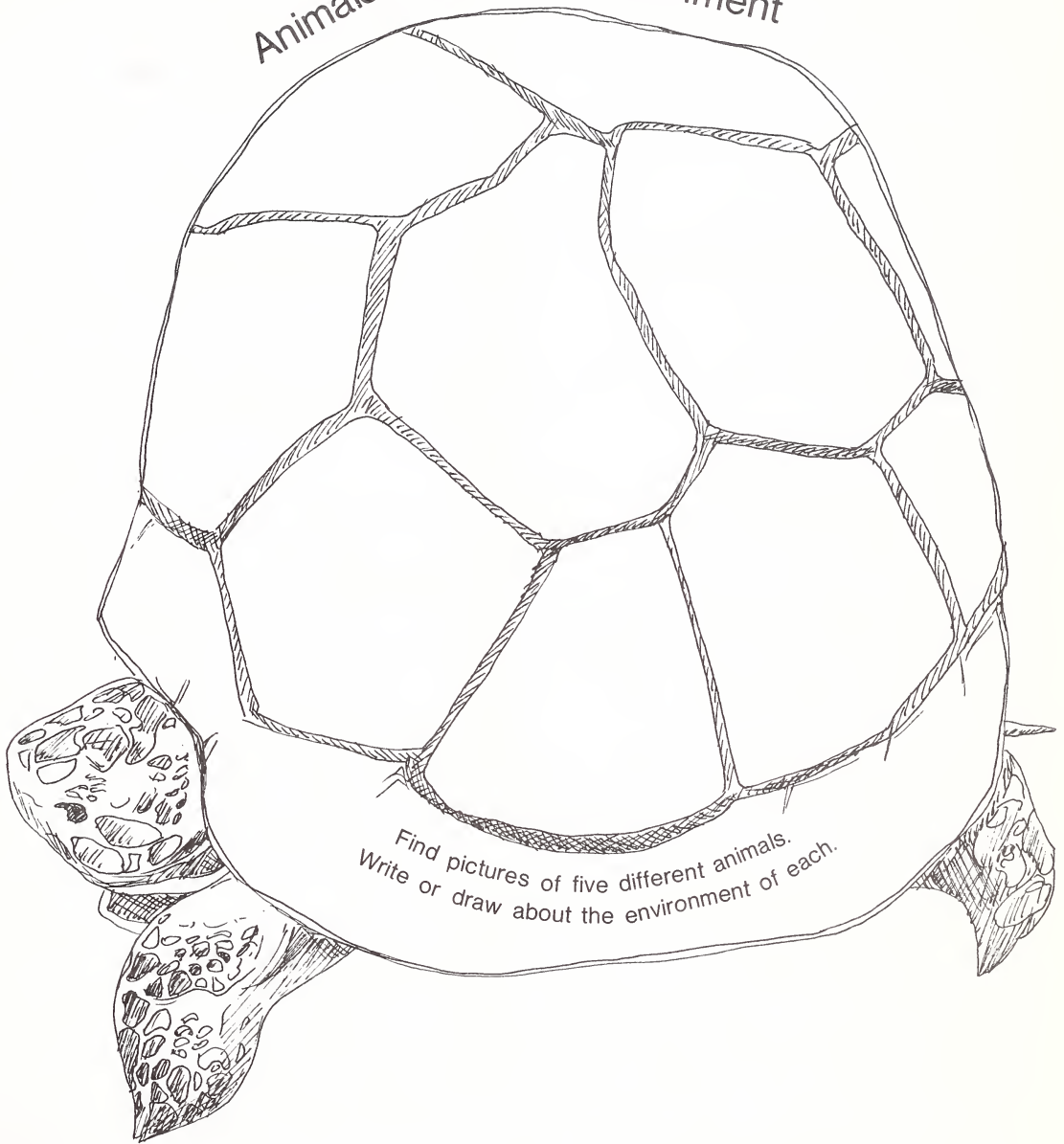








# Animals and their environment





## GOLD BOOK (2)

# Unit 3: Measuring

Pages 64-95

### UNIT OVERVIEW

#### Concept Development

Measuring is one of the skills that is essential for most investigations of objects and events. Being able to quantify observations and indicate how long, how big, how much, how often, how high, how far, how many, etc..., is important in science. This unit is designed to help develop the spatial and numerical concepts of size and quantity.

Unit 3, "Measuring," consists of seven lessons. These lessons deal with the methods of measuring things, firstly by comparing objects in relationship to other objects, and then by using established units of measure.

In the first lesson, "Measuring things" (pages 66-69), the students learn that comparing one object with another can be a useful way to measure length, capacity and mass. The lesson introduces the concept that an object can be measured in a number of dimensions, and can only be described in relation to another object or standard of measure.

The second lesson, "Measuring length" (pages 70-73), gives students an opportunity to verify their estimates of the length of something. By inventing their own units of measurement, they learn why standard units of measurement have been developed from arbitrary systems.

In the third, fourth and fifth lessons, "Centimetres" (pages 74-77), "Decimetres" (pages 78-81), and "Metres" (pages 82-85), the students measure the length of objects using the standard units of measure. It is important at this stage to develop in children the habit of taking a number of readings when measuring an object, and using measuring instruments with care, in order to increase the precision and accuracy of the measurements taken.

In the sixth lesson, "Measuring how much" (pages 86-89), the students measure how much of a substance is needed to prepare something. This concept is important in many day-to-day activities in which children may become involved.

The seventh lesson, "Measuring how heavy" (pages 90-93), introduces students to the use of scales to determine the mass of objects. Understanding the concept of mass, and being able to determine the mass of objects, are very necessary skills in a person's life.

#### Process Development

In the "Finding Out" activities, students *use numbers* to *measure* the length, quantity and mass of objects; they *predict* the measure of objects and then verify their predictions by measuring the objects; they make *inferences* about the importance of standard units of measure, measuring instruments and accuracy in measurement, and they *classify* objects in terms of their mass.

The ability of students to be able to describe objects both *qualitatively* and *quantitatively* is an important skill to develop. Students can describe an object in terms of its qualities, such as size, shape and colour, but these observations become much more significant and useful when they can be expressed in quantitative terms, by applying a standard of measure to them. For example, consider these three observations:

The tree is tall (qualitative)

The tree is 60 m high (quantitative)

The tree is taller than the school (quantitative)

The first statement is open to interpretation, because the observer's frame of reference for the concept of "tall" is not known. The second statement is more precise, and can be understood by other people, because a standard unit of measure is used to describe the height of the tree. The third statement is also quantitative, although it is not as precise, and it will only be understood by people who have seen, or know, how high the school is.

The preciseness of your students' quantitative observations at this level will depend largely on their experience with using standard units of measure.

#### Related Units

Sorting *Orange Book (1)*

Time *Orange Book (1)*

Spaces and Places *Orange Book (1)*

Heat and Temperature *Blue Book (3)*

Location, Motion, and Force *Blue Book (3)*

Air and Weather *Brown Book (4)*

Mapping the Earth *Green Book (5)*

Science: Something People Do *Exploring Matter and Energy (7)*

Technology: Using Science *Exploring Matter and Energy (7)*

Earth: Its Nature and Importance to You *Exploring Earth and Space (7)*



### Materials and Advance Planning

The following list includes the materials that a student, or a group of students, will need to carry out the "Finding Out" activities. In some instances, other materials may be substituted for those on the list:

Small box; about 100 paper clips; wire coat hanger; string; about 5 metre sticks; scissors; cardboard; can of frozen orange juice concentrate; large jar; spoon; drinking glass; scale; objects such as a book, pan, ball and brick.

### TEACHING STRATEGIES

The purpose of the following activities and teaching strategies is to provide you, the teacher, with a wide variety of suggestions that can be used, together with the material presented in the textbook, to help guide your pupils in developing the processes and concepts of this unit.

#### Measuring Record

- the suggestions on pages 68 and 69 of the text ask the children to find out many facts
- Worksheet 1 allows for the recording of these facts and requires the children to explore some other common objects
- some discussion questions that may arise from these activities are:
  - Are some objects more difficult to measure with? Why?
  - Are some containers more difficult to measure with? Why?
  - Which container held the most objects?
  - Are the objects used as the measurement units uniform? Explain their differences.

#### Measuring Workcards (1-1 to 1-12)

- this set of twelve workcards expands the "Finding Out" on pages 68 and 69 of the text
- the cards require the children to measure length, volume, and mass without using formal units of measure
- to allow for ease in making comparisons, small twelve page booklets would be effective for record keeping

#### Tape Measures

- the importance of the concept "you can find out how long something is by measuring" is shown in the number of jobs where this knowledge is used
- the children may be surprised at the number of people who measure things in their daily work
- after a discussion about who measures things and why, the children will be able to complete Worksheet 2

- individual children may choose to draw and label pictures, write a story, or make a list of as many people as possible

### Body Measures

- Worksheet 3 is a recording sheet for the whole class. It accompanies the "Finding Out" on pages 72 and 73, and gives the children the opportunity to measure not only with their feet, but also with their hands, their forearms, (from elbow to fingertips), and their whole bodies

### Measure a Friend

- the children work in pairs measuring each other
- encourage the children to predict first and then use the most convenient unit of measure to carry out their measurement tasks
- Worksheet 4 requires the children to measure specific parts of the body and label them
- if tape measures are not available, the children can use a piece of string and then determine the measurements by laying the string alongside a ruler or metre stick
- when the worksheets have been completed, they can be labelled with the names of the people measured and displayed along a wall in order of height from smallest to largest
- or comparisons can be made by transferring the recorded measurements onto a bar or line graph

### Volume

- this set of cards (Workcards 2-1 to 2-8) accompanies the concept "sometimes people measure how much of something to use" found on page 86, and is intended to have the children experiment in measuring volumes
- before assigning the cards, you will need to make a collection of some of the following: spoons, plastic cups, ice cream scoop, flour scoop, tin cans, plastic containers, small jars, bowls, buckets, eye dropper, sand, beans, rice, gravel and water
- you may have the children record their findings on a large class chart or in individual or group booklets
- after working with these cards, the children may like to make up their own Volume Cards which they can share with their classmates

### Weighing

- to emphasize the reasons behind the concept "sometimes people measure how heavy things are" (page 90 of the text), have a discussion with the children about foodstuffs that are purchased by mass
- the children can then complete Worksheet 5 by drawing and labelling appropriate foods

### How Heavy Are You?

- when the children weigh themselves as suggested

- 
- in the "Finding Out" on pages 92 and 93 of the text, have them record their masses on Worksheet 6
- it may be fun to include the weights of teachers of parents
  - if the children show interest in this activity, they may enjoy weighing themselves again in two or three months to note any losses or gains in mass.

#### Worksheet 7

- Worksheet 7 may be used anywhere in this unit or repeatedly throughout the unit. These worksheet pages may be compiled into booklets.

- this is an open form comparison sheet where a variety of meanings may be assigned to the arrows. For example, the arrow could denote "is heavier than", "is lighter than", "is longer than", "is shorter than", "holds more than", or "holds less than".
- the children can complete the worksheet by drawing an object in the large space, labelling the arrow, and drawing appropriate objects in each of the other four spaces
- the children could actually weigh or measure each object or merely make "guesstimates"





# Measurement Units

|                  |                       |  | Paper Clips | Pennies | Marbles | Toothpicks |
|------------------|-----------------------|--|-------------|---------|---------|------------|
| <b>Box</b>       | How long is it?       |  |             |         |         |            |
|                  | How much can it hold? |  |             |         |         |            |
|                  | How heavy is it?      |  |             |         |         |            |
| <b>Jar</b>       | How long is it?       |  |             |         |         |            |
|                  | How much can it hold? |  |             |         |         |            |
|                  | How heavy is it?      |  |             |         |         |            |
| <b>Can</b>       | How long is it?       |  |             |         |         |            |
|                  | How much can it hold? |  |             |         |         |            |
|                  | How heavy is it?      |  |             |         |         |            |
| <b>Paper Cup</b> | How long is it?       |  |             |         |         |            |
|                  | How much can it hold? |  |             |         |         |            |
|                  | How heavy is it?      |  |             |         |         |            |

Containers



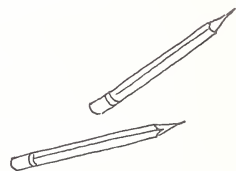
Using paperclips, measure the lengths of five different objects.

Record the measurements.



Using your pencil, measure the arm lengths of four of your friends.

Record the measurements.



Collect three different jars. How many marbles will each hold?

Record your findings.



Using your eraser, measure the length of three storybooks.

Record the measurements.



Collect four tin cans of various sizes.

How many wooden cubes will each hold?

Record your findings.



Find two cardboard cartons.

How many science books will each hold?

Record your findings.



There are several reasons  
for the increase in  
the number of people  
who are taking  
part in the program.

There are several reasons  
for the increase in  
the number of people  
who are taking  
part in the program.

There are several reasons  
for the increase in  
the number of people  
who are taking  
part in the program.

There are several reasons  
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for the increase in  
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who are taking  
part in the program.

There are several reasons  
for the increase in  
the number of people  
who are taking  
part in the program.

Using your thumb, measure the height of your chair.

Record your findings.



Find two plastic containers.

How many toothpicks will each hold?

Record your findings.



Use a book and some rocks.

Find out how many rocks equal the weight of the book.



Compare the weight of rulers and erasers.

Complete this equation:

\_\_\_\_ erasers = \_\_\_\_ rulers



Use some marbles to balance a large and a small tin can.

Record your findings.



Compare the weights of paperclips, a small jar, pencils, and a plastic container.

Record your findings.



Find the value

of the expression

when  $x = 2$  and  $y = 3$

and  $z = 4$

when  $x = 1$  and  $y = 2$

Find the value of the expression

when  $x = 3$  and  $y = 4$

when  $x = 2$  and  $y = 3$



Find the value of the expression

when  $x = 1$  and  $y = 2$

when  $x = 2$  and  $y = 3$

when  $x = 3$  and  $y = 4$

Find the value of the expression

when  $x = 2$  and  $y = 3$

when  $x = 3$  and  $y = 4$



Find the value of the expression

when  $x = 1$  and  $y = 2$

when  $x = 2$  and  $y = 3$

when  $x = 3$  and  $y = 4$

when  $x = 4$  and  $y = 5$

Find the value of the expression

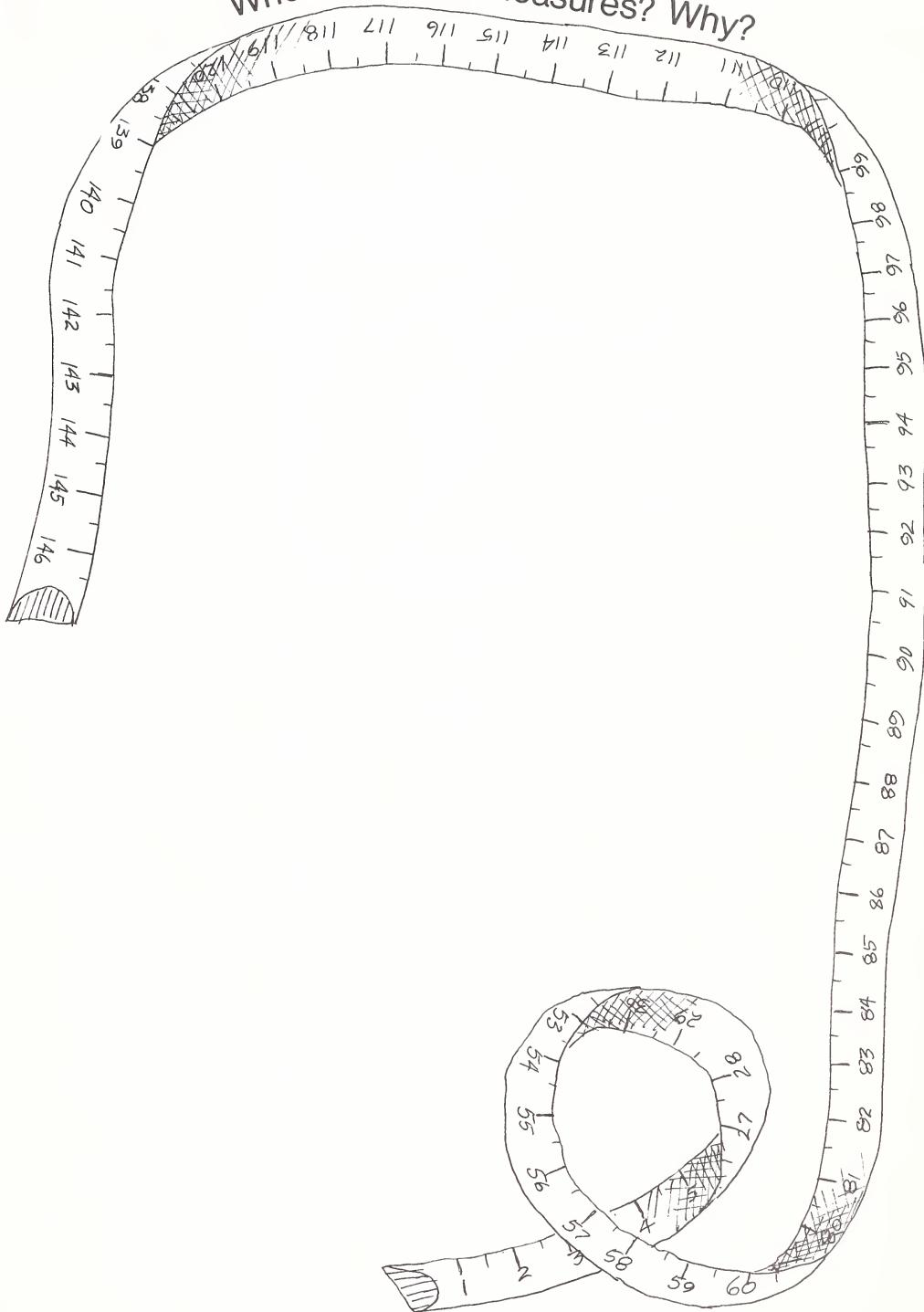
when  $x = 2$  and  $y = 3$

when  $x = 3$  and  $y = 4$

when  $x = 4$  and  $y = 5$



Who uses tape measures? Why?





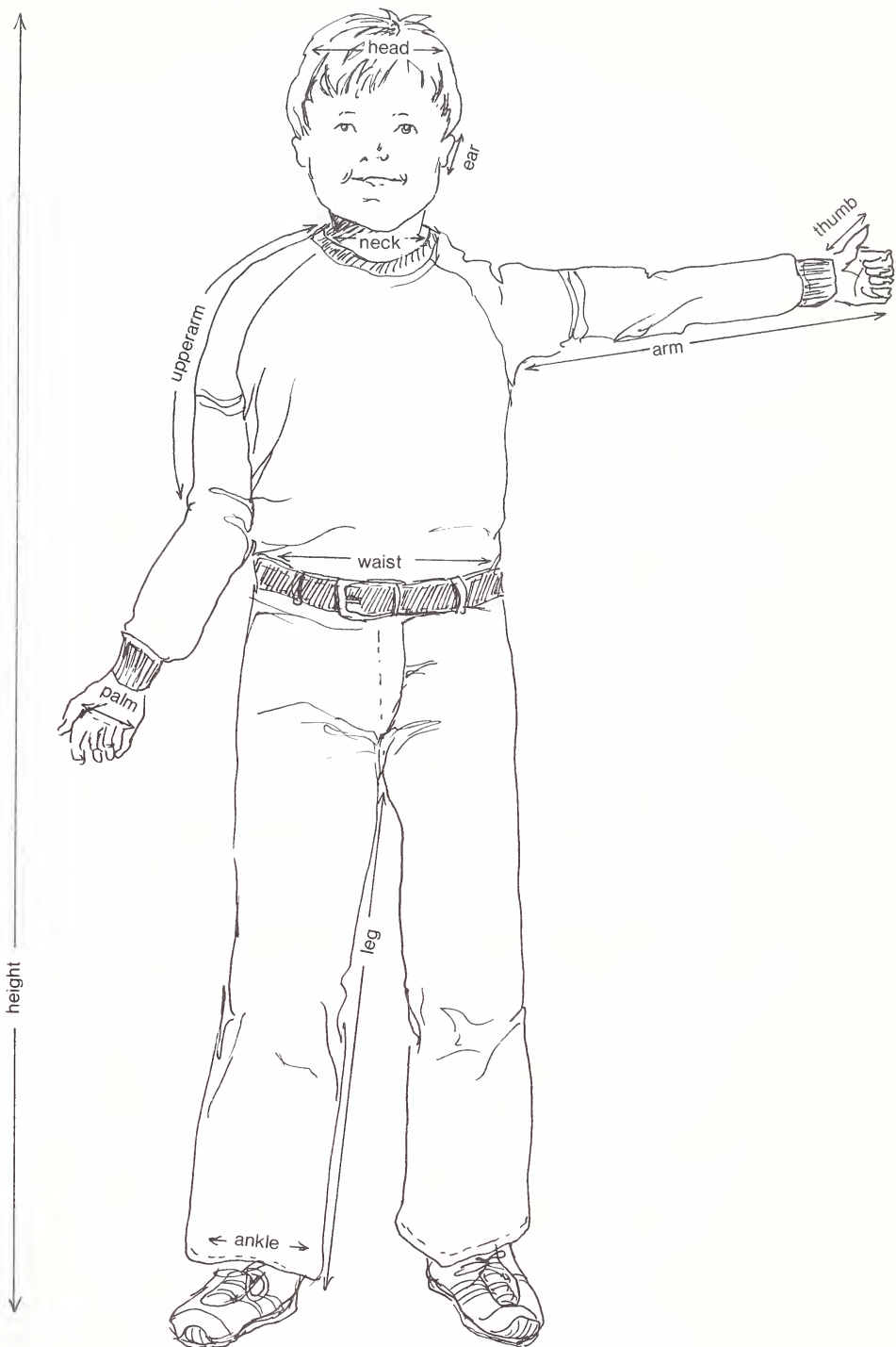


## Body Measures

[illegible]



## Measure a friend





\*1. Select a large container.

How many cups does it take to fill it?

\*3. Use an eyedropper to fill

a cup. How many times did you have to fill the eyedropper?

\*2. Fill a bowl with water.

How many cans of water are in the bowl?

4. Use an ice cream scoop

to fill a bucket. How many scoops did you use?

5. Fill a baby food jar. Pour it into a cup. About how full is your cup?

7. Using a spoon, fill a large and a

small can. How many spoonfuls are in each can?

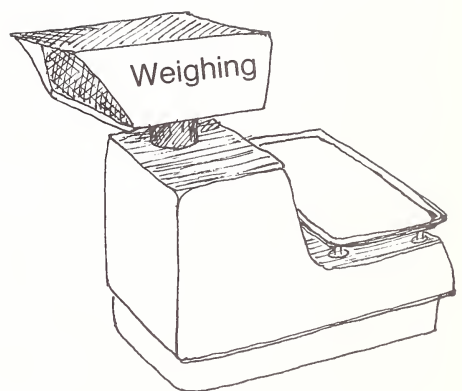
6. Fill a large container with water.

How many times do you have to fill your baster in order to empty the container?

8. Choose a large container. Fill it 3 times, using a different article each time. Record and compare your findings.

9. Choose a large container.





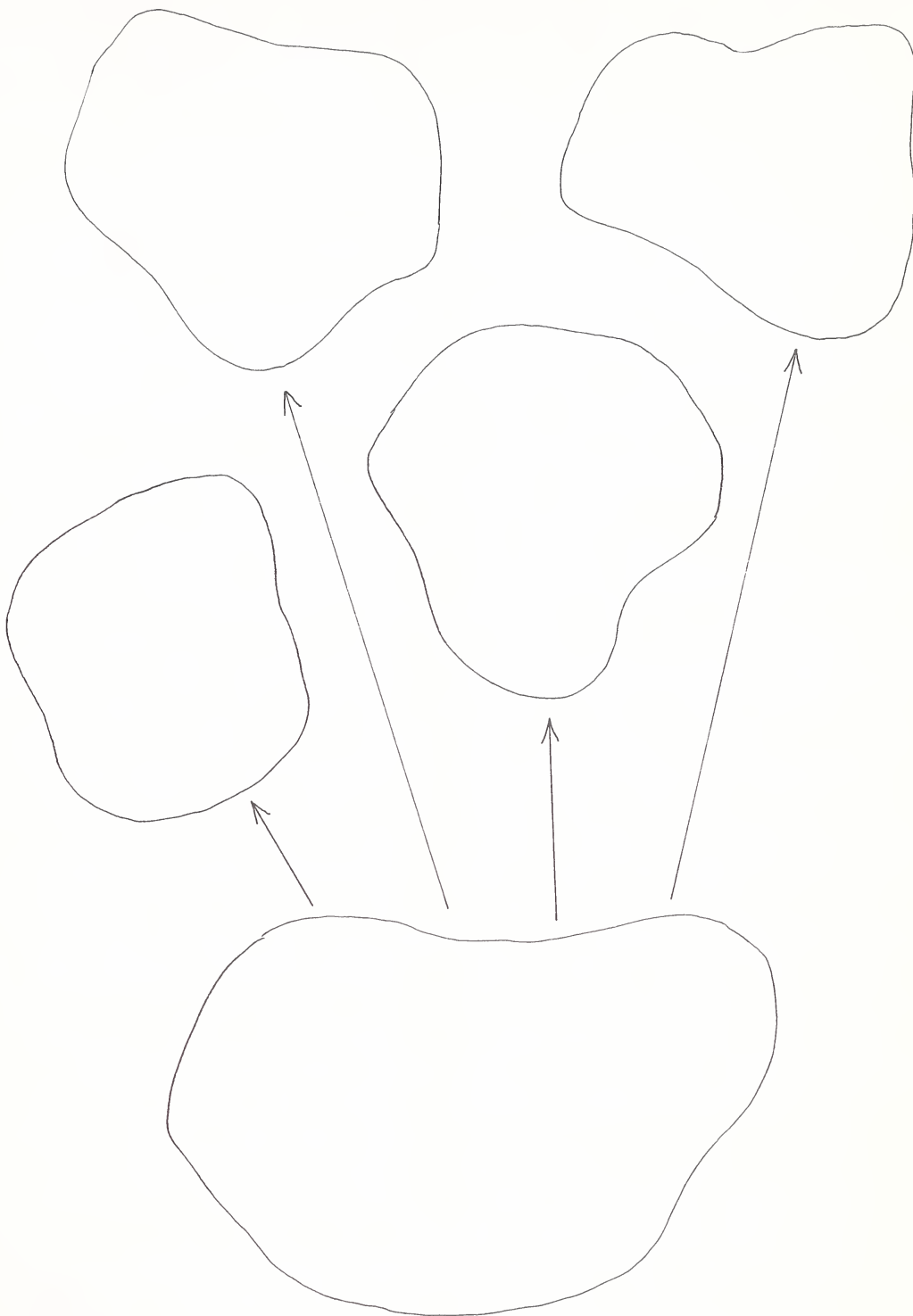




[illegible]

## Weights







## GOLD BOOK (2)

# Unit 4: Magnets

Pages 96-127

### UNIT OVERVIEW

#### Concept Development

Activities with magnets provide a good way to develop an understanding of the concept of *interactions* between objects and systems. These interactions result in *changes* that can be observed, measured, reproduced (under the same conditions), predicted and explained. Unit 3, “Magnets,” consists of eleven lessons.

The first lesson, “Kinds of Magnet” (pages 98-99), helps the students determine likenesses and differences between magnets. There are many kinds of magnets. The first magnetic material discovered was lodestone, which is a naturally magnetic iron ore. The permanent magnets that are most familiar are made of steel. More powerful magnets may be made of alnico—a mixture of iron, aluminum, nickel, and cobalt.

Lessons two through six provide the students with opportunities to explore the nature and characteristics of magnets. The ends of a magnet are called poles, and each magnet has a north pole and a south pole. From each magnet, a magnetic influence reaches out in all directions. The total influence is referred to as magnetic field. It is in this field that objects consisting of iron or steel are attracted to the magnet. Another property of magnets is that magnetism is able to act through many substances. The lessons are “Picking up things with magnets” (pages 100-103), “Magnets sticking to things” (pages 104-105), “Strong and weak magnets” (pages 106-109), “Strong parts of magnets” (pages 110-111), and “Magnets pulling through things” (pages 112-113).

The seventh lesson, “Uses of magnets” (pages 114-117), helps students discover some of the everyday uses of magnets. One characteristic and use of a magnet that is not developed in the text is that a freely suspended magnet will always come to rest pointing in a northerly/southerly direction, and will act as a compass. You may wish to demonstrate this characteristic of magnets, and discuss the uses of a compass.

The eighth and ninth lessons, “Magnets sticking together” (pages 118-119), and “Magnets pushing away” (pages 120-121), introduce the concept that opposite or unlike poles attract, whereas like poles repel each other. Thus, when the north pole of a suspended magnet is brought close to the north pole of

another magnet, the two poles will repel each other. On the other hand, when the north pole of a suspended magnet is brought close to the south pole of another magnet, the two poles will attract each other.

“Making magnets,” the tenth lesson (pages 122-123), presents the concept that magnetism can be transferred. It also provides students with information on how to make magnets.

The eleventh lesson, “Chains of magnets” (pages 124-125), helps students discover that the magnetic force of a magnet can cause a chain of objects to become magnified.

#### Process Development

There are many opportunities for individual or small group *exploration* and *experimentation* in the study of magnetism.

In the “Finding Out” activities, students *predict* what materials will be attracted or not attracted by a magnet, they carry out their investigation, and they use their *observations* to *classify* objects as magnetic or nonmagnetic. Students then *compare* the strengths of different magnets. They use their comparisons to *classify* magnets according to strengths of different magnets. They use their comparisons to *classify* magnets according to strength, and they then make *inferences* as to whether a particular magnet will be strong or weak. This is followed by an *investigation* of the polarity of magnets. Students then *observe* the use of magnets around their homes, and they *classify* the uses of magnets. There are then a number of *experiments* where students use some of the properties and characteristics of magnets to construct a play stage and players; to hang a picture; to construct a jumping frog; to make a magnetic car, and *predict* the distance that the car will travel; to make a magnet, and to form a magnetic chain.

#### Related Units

Heat and Temperature *Blue Book (3)*

Sounds Around You *Blue Book (3)*

Work and Machines *Brown Book (4)*

Electricity on the Move *Green Book (5)*

Light *Green Book (5)*

Matter and You *Red Book (6)*

Changes in Energy *Red Book (6)*

Energy: For Work and Motion *Exploring Matter and Energy (7)*

## Materials and Advance Planning

The following list includes the materials that a student, or a group of students, will need to carry out the "Finding Out" activities. In some instances, other materials may be substituted for those on the list:

Magnets (different sizes and strengths); many different small objects, including some made of iron or steel (nails, etc. . . .); cardboard; scissors; glue or tape; paper clips; tracing paper; crayons

## TEACHING STRATEGIES

The purpose of the following activities and teaching strategies is to provide you, the teacher, with a wide variety of suggestions that can be used, together with the material presented in the textbook, to help guide your pupils in developing the processes and concepts of this unit.

### A Magnet Will Pick Up

- pages 100-103 of the text deal with the concept "magnets can pick up things that have iron in them"
- Worksheet 1 allows the children to record their observations of the suggested experiments
- the children may draw and label or make up a list of the objects that magnets will pick up

### Testing Magnets

- to reinforce the concept "there are many kinds of magnets" stated on page 98 of the text, the children should have an opportunity to work with a variety of magnets
- because some magnets are stronger than others, the children can try the activities suggested in the "Finding Outs" on pages 108 and 109, and use Worksheet 2 to record their findings
- a tally sheet, such as this, is useful for making comparisons

### Magnets Are Used . . .

- Worksheet 3 complements pages 114-117 of the text and allows the children to show the many uses of magnets
- recalling how magnets are used, this worksheet requires the children to observe and classify magnets according to where and how they are used
- encourage the children to draw and then label their pictures

### Just Suppose . . .

- Worksheet 4 complements the concept "iron objects can be made into magnets", (pages 122 and 123 of the text), and requires the children to use their imaginations

## Chains of Magnets

- following the directions in the "Finding Out" on page 125 of the text, the children take turns making a chain of iron things
- as each conducts the experiment, the children's names and results are placed on Worksheet 5
- the bar graph that will result will allow for easy comparison of chain lengths and will encourage the children to discover how the longest chain was made (Note the information given in the Sample Findings on page 125 of the text.)

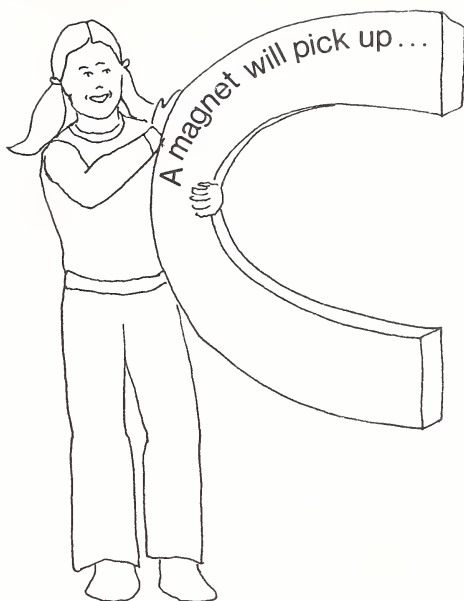
## Magnetic Toss

- a magnetic toss game will be fun for the children and will reinforce their basic number facts
- a stove board or a cookie sheet can be divided in a grid pattern with numbers placed in the grid as shown below
- the children take turns tossing two magnets onto the board and adding the two numbers on which the magnets land
- a variation of this game would be to label the board with letters or phonetic sounds, and have the children toss one magnet giving an appropriate word

|   |   |   |   |
|---|---|---|---|
| 3 | 8 | 6 | 0 |
| 1 | 4 | 9 | 2 |
| 5 | 7 | 2 | 8 |
| 9 | 0 | 4 | 5 |
| 3 | 6 | 1 | 7 |

## Magnetic Clues

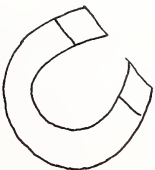
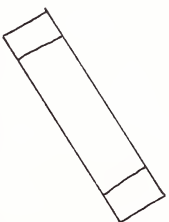
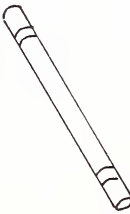
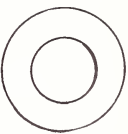
- by recalling the concepts learned in this unit the children can complete Worksheet 6, filling in each blank with the appropriate word
- the following key will aid in marking:
  1. horseshoe
  2. pick up
  3. strong
  4. pull
  5. uses
  6. push
  7. stick
  8. iron
  9. force
  10. magnets







## Testing Magnets

|  | paper clips | thumb tacks | scissors | pins | toy cars | screws | hair pins |
|--|-------------|-------------|----------|------|----------|--------|-----------|
|   |             |             |          |      |          |        |           |
| horseshoe  |             |             |          |      |          |        |           |
|   |             |             |          |      |          |        |           |
| bar  |             |             |          |      |          |        |           |
|   |             |             |          |      |          |        |           |
| cylindrical  |             |             |          |      |          |        |           |
|  |             |             |          |      |          |        |           |
| ring   |             |             |          |      |          |        |           |

Which type of magnet will pick up the most objects? Which type picks up the least?

2. A student has a 100 mL beaker containing 50 mL of water. The student adds 50 mL of a liquid to the beaker. The student observes that the liquid does not mix with the water. The student then adds 50 mL of a solid to the beaker. The student observes that the solid sinks to the bottom of the beaker. The student then adds 50 mL of a gas to the beaker. The student observes that the gas bubbles rise to the surface of the beaker. The student then adds 50 mL of a powder to the beaker. The student observes that the powder settles to the bottom of the beaker. The student then adds 50 mL of a liquid to the beaker. The student observes that the liquid mixes with the water. The student then adds 50 mL of a solid to the beaker. The student observes that the solid floats on the surface of the beaker. The student then adds 50 mL of a gas to the beaker. The student observes that the gas bubbles rise to the surface of the beaker. The student then adds 50 mL of a powder to the beaker. The student observes that the powder settles to the bottom of the beaker.



Magnets are used...



... in your home



... in your school



... in your community



Just suppose ...



Just suppose that  
somehow you became  
magnetized!  
Draw and write about your experiences.









## Magnetic Clues

1. One type of magnet is shaped like a \_\_\_\_\_.
2. Magnets \_\_\_\_\_ things with iron in them.
3. There are \_\_\_\_\_ and weak magnets.
4. Magnets \_\_\_\_\_ through things.
5. There are many \_\_\_\_\_ for magnets.
6. Magnets can \_\_\_\_\_ away from each other.
7. Magnets \_\_\_\_\_ to things with iron in them.
8. \_\_\_\_\_ objects can be made into magnets.
9. With the \_\_\_\_\_ of a magnet you can make chains of iron objects.
10. \_\_\_\_\_ can stick to each other.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

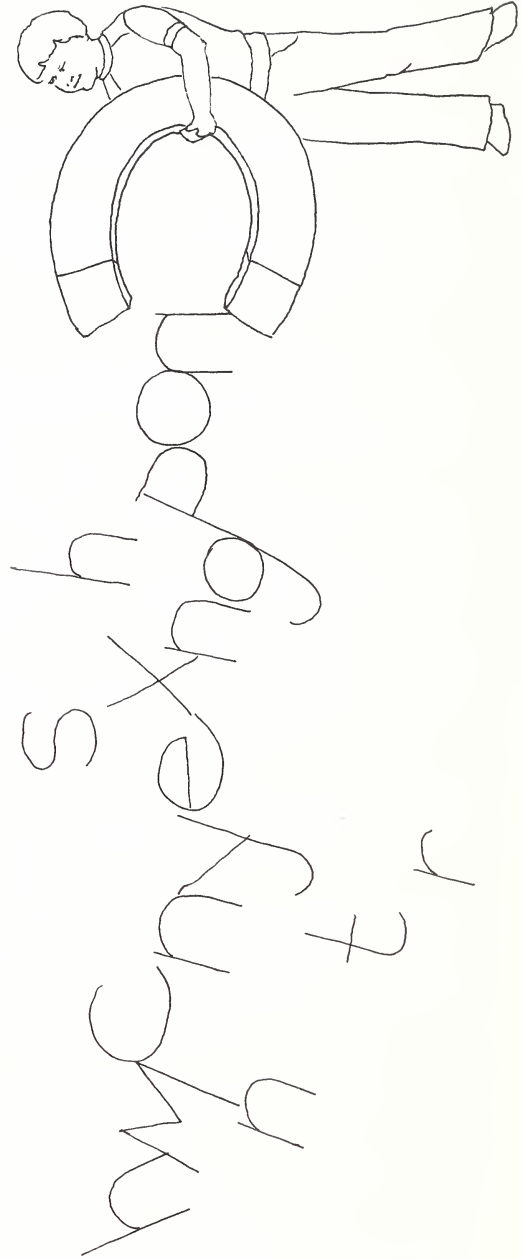
\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_





## GOLD BOOK

# Unit 5: The Moon

Pages 128-159

### UNIT OVERVIEW

#### Concept Development

Children are exposed to many ideas about space and space exploration through television, films, and books. Their interest in space-related material is generally high.

In the preceding level of the program, students were introduced to the concepts of distance, direction, position in space and time, in the units "Light and Shadows", "Time" and "Spaces and Places". These concepts were developed by using experiences in the immediate environment of the child. In this unit, many of the concepts will be unfamiliar and strange to the students' experience. An attempt is made to help children understand these new concepts by relating them to activities, models and analogies that are within their experience.

Unit 5, "The Moon," consists of twelve lessons. These lessons are designed to help students gain a greater understanding of the moon, its relationship to the earth and of lunar and space exploration.

The first three lessons, "The moon at night" (page 130), "The moon during the day" (page 131), and "Moonlight" (pages 132-133), help students understand the concept that the moon is visible from the earth because of reflected light from the sun.

The fourth lesson, "Rising and setting of the moon" (pages 134-135), develops the concept that it is in fact the rotation of the earth which causes the moon to appear to move from east to west across the sky.

The fifth lesson, "Path of the moon" (pages 136-137), the sixth lesson, "Shapes of the moon" (pages 138-143), and the seventh lesson, "Seeing one side of the moon" (pages 144-145), help students understand the moon's orbit and how its orbit affects the way the moon is seen by people on the earth.

Information about the characteristics and appearance of the moon's surface is presented in the eighth lesson, "The moon's surface" (pages 146-147).

The ninth and tenth lessons, "The moon and the earth" (pages 148-149), and "People on the moon", (pages 150-151), help clarify the students' concept of the nature of the moon by having them observe and state differences between the earth and the moon. This comparison also helps the pupils understand more clearly what things are needed for people to survive not only on the earth but also on the moon.

"Maps of the moon," the eleventh lesson, (pages 152-153), presents the concept of the usefulness and purpose of maps of the moon.

The twelfth lesson, "Other things in space", (pages 154-157), provides students with an opportunity to learn about other things in space besides the moon.

#### Process Development

In the "Finding Out" on page 133, students set up an experimental model to *demonstrate* that the moon can be seen from the earth because of reflected light from the sun. They use their *observations* in this investigation to make *comparisons*.

On page 140, students carry out an *experiment* to *demonstrate* the phases of the moon. The concept of the phases of the moon is reinforced in the next "Finding Out" on page 142, where students *observe* the moon on a particular night, draw the phase on a calendar, *predict* the phase of the moon for the following day, and on the following day *verify* their prediction by observation. The *data* is again placed on the calendar. This procedure can be carried on for a period of time.

The students then construct a model to demonstrate that as the moon moves around the earth, the same side of the moon always faces the earth. Students use their *observations* in this investigation to make *inferences*.

Students then investigate other things in space (page 156). They *collect data* by finding pictures and photographs, they *classify* these pictures, and they then *communicate* their investigation through charts, drawings and by discussions.

#### Related Units

Time *Orange Book (1)*

Spaces and Places *Orange Book (1)*

Light and Shadows *Orange Book (1)*

Watching the Sky *Brown Book (4)*

The Earth in Space *Red Book (6)*

Universe: Exploring Environments in Space *Exploring Earth and Space (7)*

#### Materials and Advance Planning

Flashlight; ball; globe; paper; pencils; crayons; old magazines and newspapers; scissors.

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## TEACHING STRATEGIES

The purpose of the following activities and teaching strategies is to provide you, the teacher, with a wide variety of suggestions that can be used, together with the material presented in the textbook, to help guide your pupils in developing the processes and concepts of this unit.

### Wax Resists

- to expand upon the concepts “the moon may be seen at night” and “the moon may be seen during the day” on pages 130 and 131 of the text, have the children make wax resists
- instruct the children to use wax crayons to draw scenes which include the moon. For best results make sure that the children press heavily with their crayons.
- after the crayoned scenes are completed, have the children brush watery blue paint over their papers
- by using both pale blue and dark blue washes it becomes evident that the moon can be seen more clearly at night than during the day

### Moon Calendar

- Worksheet 1 accompanies the “Finding Out” on pages 142 and 143 of the text
- for a period of at least one month have the children make a daily record of their nighttime observations of the moon
- in the space provided below the calendar, the children may record in writing what they have observed. For example, they may note that “the moon looked like a circle on two nights”.

### Moon and Earth

- after a discussion about the differences between the moon and the earth as suggested on pages 148 and 149 of the text, the children will be able to complete Worksheet 2
- their drawings may be accompanied by a written statement describing each landscape

### A Trip to the Moon

- after discussing the questions found on pages 149 and 151 of the text, the children will realize that they would need certain things for survival on the moon

- using Worksheet 3, have the children compile a list, or write a short paragraph, about the things necessary for life on the moon
- the completed spacecrafts can be outlined or shaded, and cut out for display

### Moon Environment

- as an extension of the discussion questions on page 151 of the text, have the children use their knowledge and their imaginations to draw an environment so man could live on the moon
- the children could be expected to give oral or written explanations of the environments they have created

### Space Search

- have the children look carefully at the puzzle on Worksheet 4
- by searching down and across, the children will be able to find and ring the space words listed at the bottom of the page
- instruct the children to check off each word on the list as they find it

### Space Collage

- as an alternative to the activity suggested in the “Finding Out” on pages 156 and 157 of the text, you may have the class make a collage by assembling their drawn and cut-out space pictures
- in addition, the children may enjoy:
  - building spacecrafts from blocks or balsa wood
  - molding a lunar landscape from *papier mâché*
  - creating a space scene from torn or cut paper and fabric scraps
- you may wish to use worksheet 5 in this activity

### Creative Writing

- the Workcards 1-1 to 1-10 will give the children opportunities to use their imaginations while practising their writing skills
- while these topics are related to the concepts taught in this unit, the children, in their creative writing, will most likely employ their imaginations beyond the facts and concepts that they have learned

# My Moon Calendar for \_\_\_\_\_

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|--------|--------|---------|-----------|----------|--------|----------|
|        |        |         |           |          |        |          |
|        |        |         |           |          |        |          |
|        |        |         |           |          |        |          |
|        |        |         |           |          |        |          |
|        |        |         |           |          |        |          |
|        |        |         |           |          |        |          |



The moon... \_\_\_\_\_

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The Moon

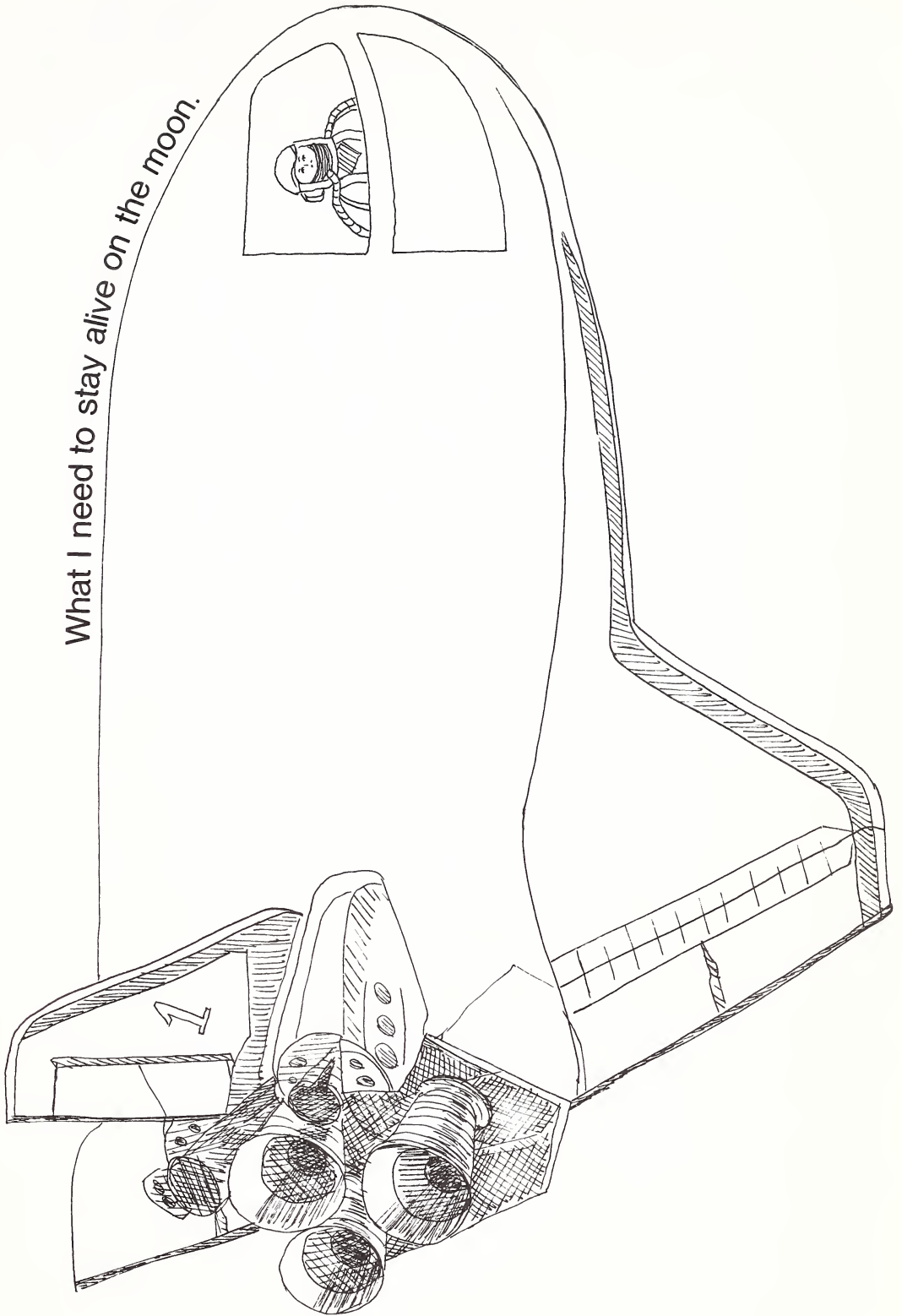


The Earth





What I need to stay alive on the moon.





# Space Search

|   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S | P | A | C | E | C | A | P | S | U | L | E |
| H | W | M | O | B | R | T | H | T | S | U | N |
| O | O | N | M | I | A | B | I | A | A | N | T |
| O | S | P | E | G | T | C | L | R | T | A | D |
| T | P | E | T | D | E | G | S | H | E | R | A |
| I | A | R | S | I | R | E | P | U | L | M | S |
| N | C | O | R | P | W | S | A | T | L | O | P |
| G | E | C | V | P | M | U | C | B | I | D | A |
| S | B | K | C | E | O | L | E | Y | T | U | C |
| T | F | E | J | R | O | P | S | K | E | L | E |
| A | S | T | R | O | N | A | U | T | S | E | C |
| R | S | A | T | U | R | N | I | G | Y | F | R |
| S | K | Y | C | G | O | H | T | J | K | L | A |
| M | I | O | N | U | V | E | A | R | T | H | F |
| B | P | L | A | N | E | T | J | A | S | W | T |
| G | F | E | M | P | R | A | M | O | O | N | B |

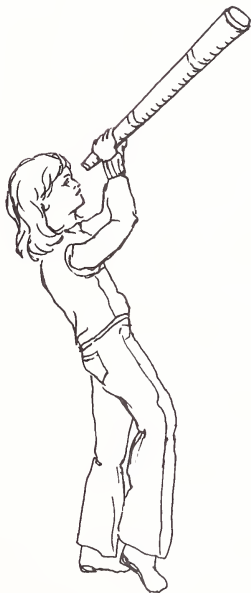
SPACESUIT  
MOON ROVER  
BIG DIPPER  
SUN  
LUNAR MODULE  
COMETS  
SATURN

SPACE CAPSULE  
ASTRONAUT  
SKY  
PLANET  
SPACECRAFT  
EARTH  
SATELLITES

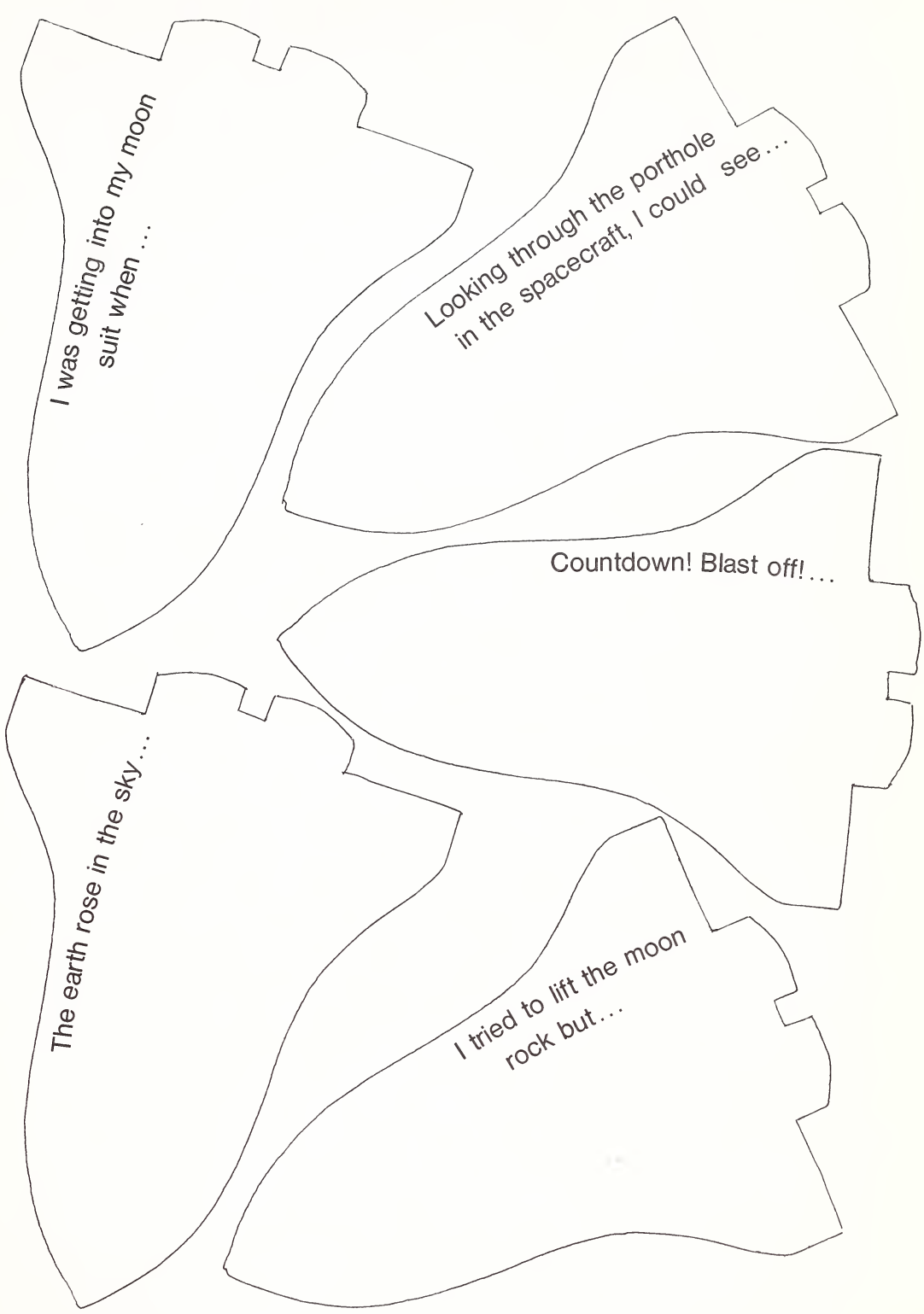
SHOOTING STAR  
MOON  
SPACE  
ROCKET  
CRATER  
STAR



What I can see in space







I was getting into my moon  
suit when ...

Looking through the porthole  
in the spacecraft, I could see ...

Countdown! Blast off! ...

The earth rose in the sky ...

I tried to lift the moon  
rock but ...





Suddenly my moon crawler  
stopped and....

Peering over the edge of a  
crater....

Opening the hatch of my  
moonship, I found....

As my landing craft plummeted  
toward the moon....

My rocket ship blasted off  
for the moon and....



## GOLD BOOK (2)

# Unit 6: Rocks and Soil

Pages 160-189

### UNIT OVERVIEW

#### Concept Development

In the preceding level of the program, the following concepts were introduced and developed:

Rocks and soil are part of our environment. They are an important resource. Plants need soil in order to live and grow. Objects can be sorted by their similarities and differences, and in a variety of ways.

Children from an early age become aware of the concept that there are many different kinds of rocks. The variations that children perceive are differences in colours, textures, sizes, masses and shapes.

In the first four lessons, "Finding rocks (pages 162-165), "How rocks are different" (pages 166-167), "Changes in rocks" (pages 168-171), and "Using rocks" (pages 172-173), students sharpen their understanding of the differences, and by using classification systems to group the rocks. The concepts that rocks, soil and water cover the earth's surface; that rocks are constantly changing; that the forces of wind, water and changes in temperature change rocks, and that rocks have many uses, are also developed.

Lessons five to eight, "What is soil made of?", (pages 174-177), "Finding soil", (pages 178-181), "Soil and living things", (pages 182-183), and "Taking care of soil", (pages 184-187), develop some concepts about soil. These are: that soil is made up of many things; that different kinds of soil have different properties; that soil is an important part of our environment; and that we have responsibility for caring for soil.

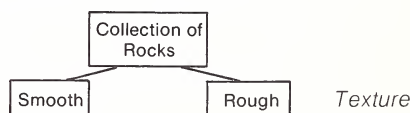
#### Process Developing

In the "Finding Out" activities, students *observe* places where soils and rocks are found; they *compare* differences that occur in rocks and soils; they observe changes in rocks and soils, and they observe the composition of soils. They also observe how seeds grow in different types of soil. Students use these observations to make *comparisons*, to develop *classification* systems, and to make *inferences* and *predictions*.

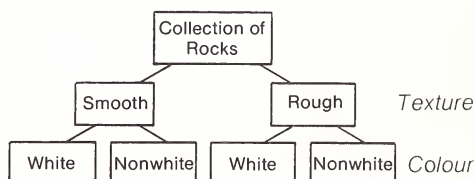
In the *classification* activities in the unit, you may wish to have your students start by dividing their collections into two subsets, using one observable property. This is a *single stage classification system*. Properties such as location, size, weight, shape,

colour, texture, and hardness may be used to sort their collections. You may then wish to have them develop *two stages*, or *multi-stages*, *classification systems*, where students sort their collections into further subsets by using more than one property.

#### Single Stage Classification System



#### Two Stage Classification System



In the "Finding Out" on page 183, where students investigate how well plants grow in different soils, you may wish to discuss the importance of *identifying and controlling variables* in an experiment. You may wish to point out that students should use the same type and number of seeds, planted at the same depth. Students should also ensure that each container of seeds receives the same amount of light and water. The temperature conditions for each container should also be kept the same.

#### Related Units

Living Things *Orange Book (1)*

Sorting *Orange Book (1)*

Environment *Gold Book (2)*

Seed Plants *Blue Book (3)*

The Changing Land *Green Book (5)*

Ecosystem Earth *Red Book (6)*

Earth: Its Nature and Importance to You *Exploring Earth and Space (7)*

#### Materials and Advance Planning

The following list includes materials that a student, or a group of students, will need to carry out the "Finding Out" activities. In some instances, other things may be substituted for those on the list:

Paper; crayons; paper bag; plastic bucket; rocks; coins; tin can; hammer; cloth; protective glasses; shovel; bucket; jar; spoon; broom; seeds such as lima beans or radishes; 2 or 3 kinds of soil such as topsoil, clay, potting soil and sand; 2 or 3 milk cartons; scissors; dry soil; pan or dish; cardboard

## TEACHING STRATEGIES

The purpose of the following activities and teaching strategies is to provide you, the teacher, with a wide variety of suggestions that can be used, together with the material presented in the textbook, to help guide your pupils in developing the processes and concepts of this unit.

### Rocks are Found

- as an extension of the "Finding Out" on page 164, each child or small group of children could complete this worksheet
- the children may draw, print, or paste cut-out pictures on this worksheet to illustrate where rocks are found

### Rock Collection (Workcards 1-1 to 1-15)

- this set of workcards can be used with the rocks collected for the "Finding Out" on page 164
- many of these workcards will extend the concepts found in this section on rocks

### Rock Around The Clock

- the children sit in a circle on the floor
- one child is chosen to be "it"
- "it" sits in the centre, with eyes hidden, while the others chant the following verse and pass the rock around the circle
  - As the clock goes tickety-tock
  - Round and round goes the rock,
  - When the clock strikes two
  - Hide the rock behind you!
- when the children say "... behind you!", everyone, including the person who has the rock, puts their hands behind their backs
- "it" has three guesses to discover who is hiding the rock

- after a correct guess or three incorrect guesses the person who has the rock becomes "it"

### Rubbings

- this activity will clarify the concept that rocks are different in texture (refer to text page 166)
- have the children place a piece of paper on top of a rock and, using a pencil or a crayon, rub over the surface
- the rubbings can be made into an interesting collage

### Rocks Where I Live (Worksheet 2)

- this worksheet expands upon the concept that people use rocks in many ways
- after discussing how and where rocks are used, send the children home to observe any rocks that are found in or near their dwelling
- the children can complete this worksheet by illustrating their observations or by describing them in words

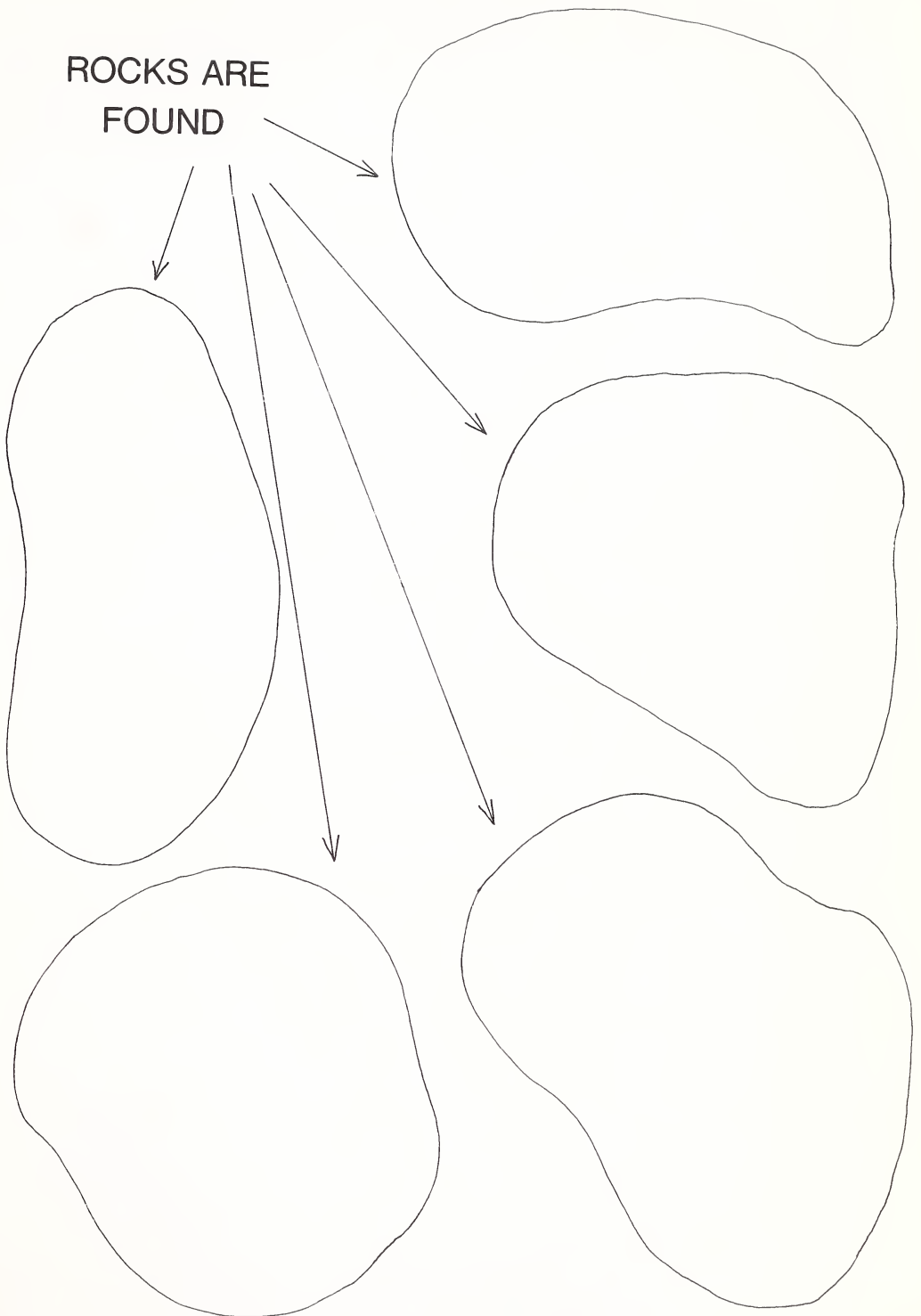
### Plotting and Examining

- plotting and examining a small area of ground will reinforce the concept that soil is made up of many things
- a small plot of ground, found within the school-grounds or in someone's backyard, could be dug, enabling the children to observe the soil structure
- if several plots are dug and examined, comparisons can be made and shown by graphs, charts, displays and collages
- samples of the materials found can be collected in baby food or other small jars, plastic sandwich bags, or envelopes

### Soil is Found (Worksheet 3)

- after the children have discovered that soil is found in many places (refer to text page 178) the following worksheet may be useful
- the children either draw or paste pictures to show some of the places where soil is found
- some children will be able to add a statement about each drawing or picture

ROCKS ARE  
FOUND





Choose one rock. List  
3 things that are lighter  
than the rock.

Choose a rough rock. Dip  
it in paint and print  
a design with it.

Using a balance, try to  
find 2 smaller rocks that  
weigh the same as 1  
larger rock.

Make a big rock pile.  
How high can you pile the  
rocks without having them  
topple over.

Paint a rock. Add felt,  
pipe cleaners, corks, paper,  
a real or imaginary  
animal.





Fill a jar with rocks and have classmates try to estimate how many are in the jar.

Choose one rock. List three things that are heavier than the rock.

Paint a rock to make it into a beautiful paper weight.

Try rolling a rock along the floor. Are some rocks easier to roll than others?

Try running while balancing a rock on a stick. Are some rocks easier to balance than others?



Take the smallest rocks  
you have found, and glue  
them onto a piece of heavy  
paper to make a design.

Choose one rock. List 4  
things that are smaller  
than the rock.

Choose a speckled rock.  
Write down all the colours  
you see in it.

Choose one rock. List 3  
things that are bigger  
than the rock.

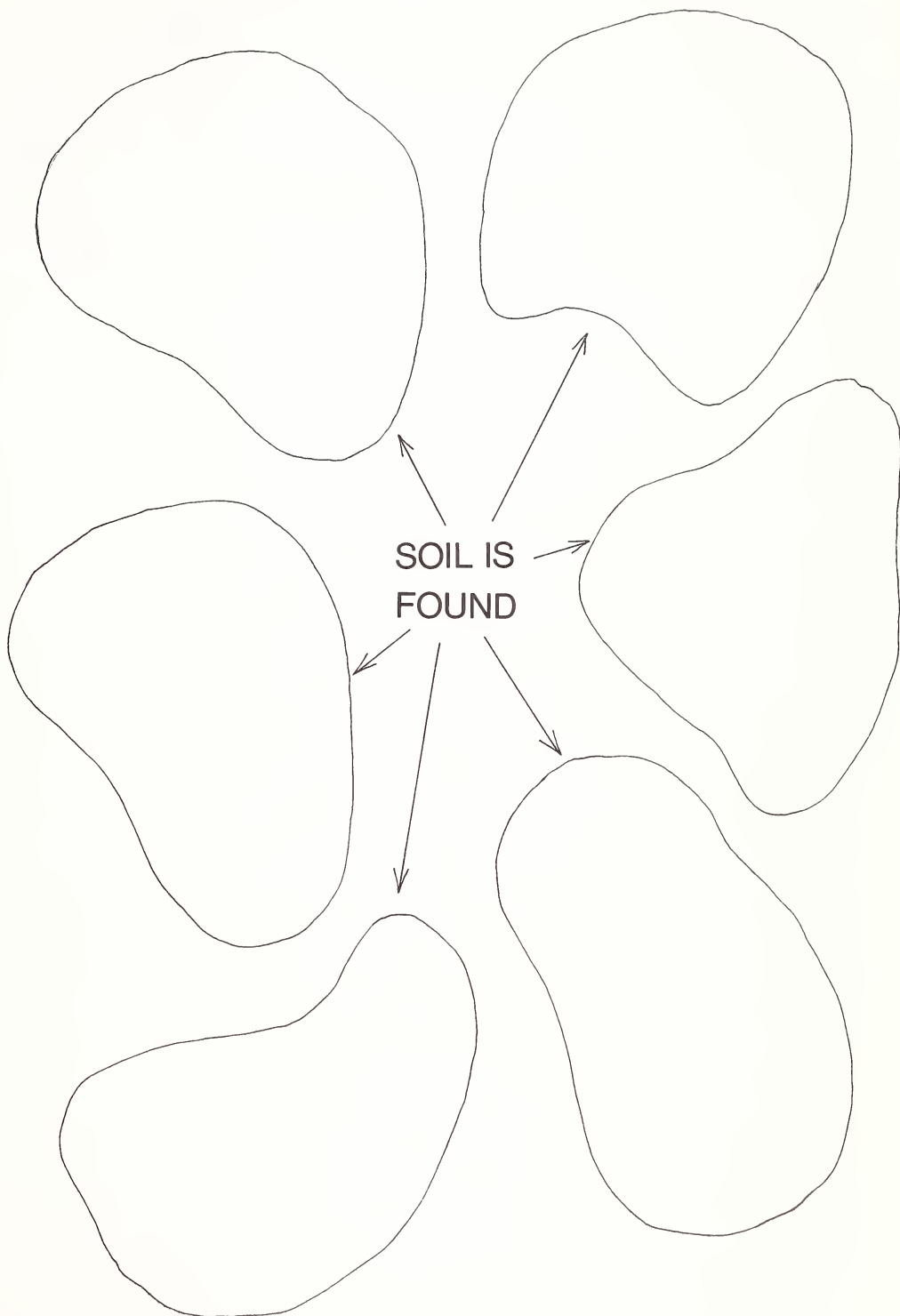
Put a rock in a pan of  
water. Does it float or sink?  
How could you make it  
float?



Rocks where I live ...











## NOTES



## NOTES

# DATE DUE SLIP

|                     |                    |
|---------------------|--------------------|
| APR 22 '83          | FEB 1 1984         |
| RETURN APR 18 '83   | OCT 14 '89         |
| DUE EDUC OCT 5 '83  | OCT 12 RETURN      |
| RETURN OCT 3 - '83  | DUE EDUC NOV 6 '89 |
| DUE EDUC NOV 23 '83 | NOV 02 RETURN      |
| DUE EDUC NOV 30 '83 |                    |
| RETURN NOV 29 1983  |                    |
| DUE EDUC DEC 17 '83 |                    |
| JAN 3 RETURN        |                    |
| DUE EDUC MAR 21 '84 |                    |
| MAR 20 RETURN       |                    |
| DUE EDUC MAR 28 '84 |                    |
| MAR 26 RETURN       |                    |
| FEB 1 1984          |                    |

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